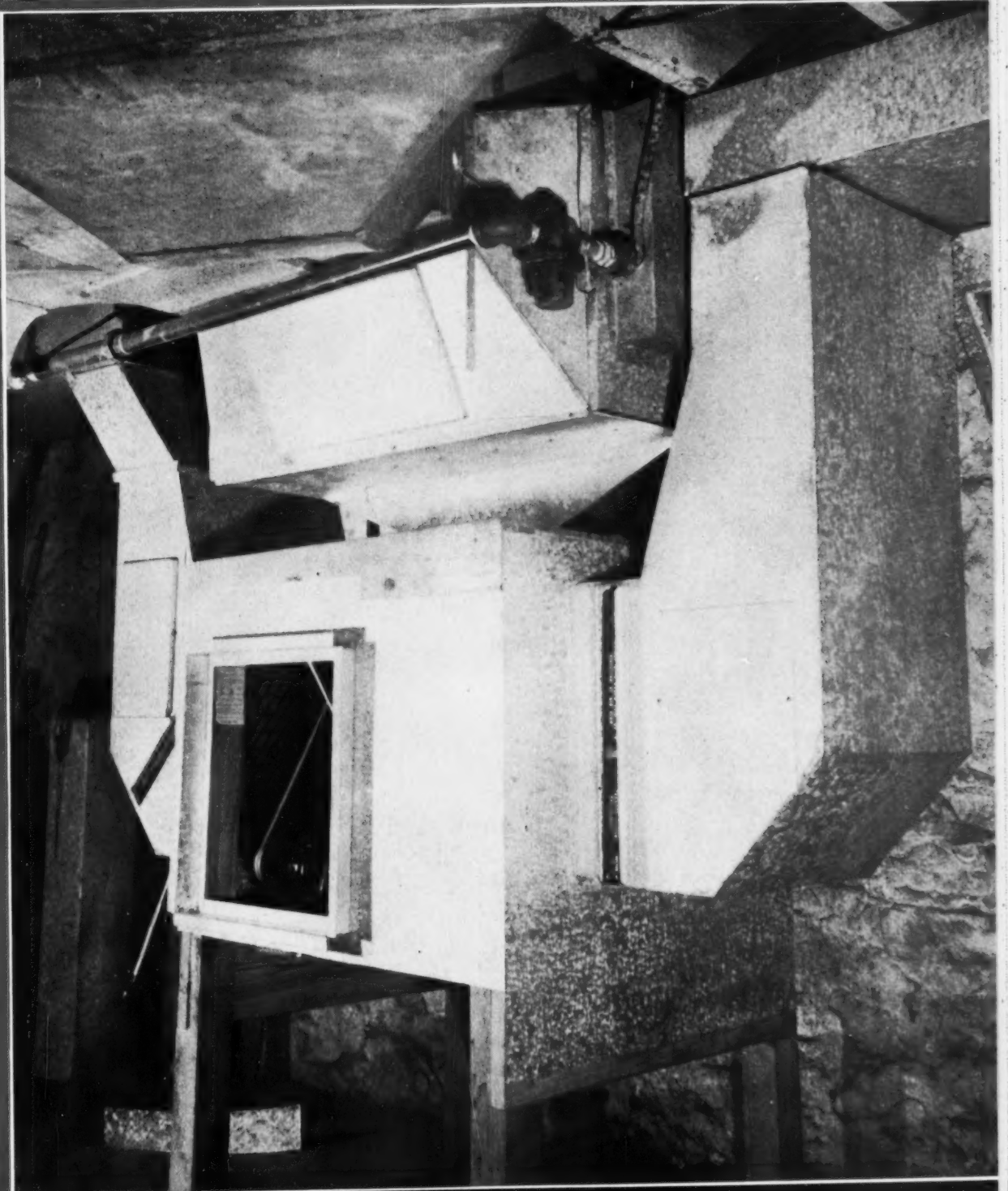


AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL
CONTRACTING • AIR CONDITIONING



ABLISHED
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BRUARY
1935

THE AIR CONDITIONING SECTION

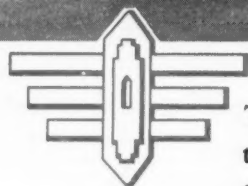
Page 23

AMERICAN ARTISAN

don't wait for business...
DRIVE IT IN with



The construction of this recently-completed modern service station, Des Moines, Iowa, involved the use of 7600 pounds of Toncan Iron Sheets. It was used for all the sheet metal work, including the canopy paneling. The Kuchar-Sygarman Construction Co. were general contractors and Backman S. M. Works were the sheet metal contractors.



There is every indication that there are better days ahead for the sheet metal contractor.

Business will come from both new construction and replacement work. But competition will be just as keen as in the past. You can't wait for business to drift into your plant. You have to go out after it and drive it in.

Drive it in by talking quality—by using Toncan Iron to back up your arguments. Lift your work out of the ordinary class. Make it clear that your quotation is low regardless of the price—because your work will last longer—

give better service—cost less per year for replacements.

Toncan Iron lasts longer, because it is an alloy of refined open hearth iron, copper and molybdenum. It resists rust. It fabricates easily. It is the real reason why many sheet metal contractors have continued to make a profit during the rough going of the last few years. Write today for the interesting story of this business-building sheet metal.

Republic Steel



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A Real Sales Manual

Just off the press—real authoritative information on Air Conditioning and Air Conditioning Controls and Equipment. All of the data listed—with charts, diagrams and performance curves—describes the needed equipment. Explains the very latest, most advanced principles. Shows designs, controls, and equipment for all makes and types of hot air, hot water, steam and duplex heating plants—for use with coal, oil, or gas. Catalog—Manual—Sales Portfolio—all combined. Starting with a remarkable chart that gives Air Conditioning Functions, it shows at a glance all equipment needed for each function, and for each type of plant. Information for heating men and home owners. Everything clearly priced, but with *retail* prices only. You can start Selling right from this book. It's all you need to start.

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AMERICAN ARTISAN

With which is merged

**FURNACES
AND
SHEET METALS**

AND

**Warm-Air
Heating**

Vol. 104, No. 2

February, 1935

Founded 1880

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More than 7,000 copies of this issue are being distributed.

ANACONDA THROUGH-WALL FLASHING

being installed in
new Holyoke, Mass.,
Post Office Building

**NEW...and
Moderately Priced!**



TO SHEET metal contractors interested in a simple but highly effective copper wall flashing at a moderate price, The American Brass Company offers Anaconda Copper, either plain or lead coated, in strips five feet long, embossed with a zig-zag pattern of ridges 7/32" high.

This new Anaconda product provides a sound bond with maximum resistance to lateral movement in every direction. Efficient and positive, it is readily adapted to practically every brick or masonry condition.

Capable of being bent and cut to fit on the job,

Anaconda Flashings can be installed easily and quickly. The flat selvages are ideal for making roof and counter flashing bends without unsightly ridges to interfere with the discharge of water. Water-tight end-joints are made by overlapping one corrugation. When required, flat ends permit easy soldering.

*Patented May 2, 1933 (Pat. No. 1,906,674)

Anaconda Through-wall Flashings may be obtained from distributors of Anaconda Copper. Our new descriptive folder, Anaconda Publication C-28, mailed on request.

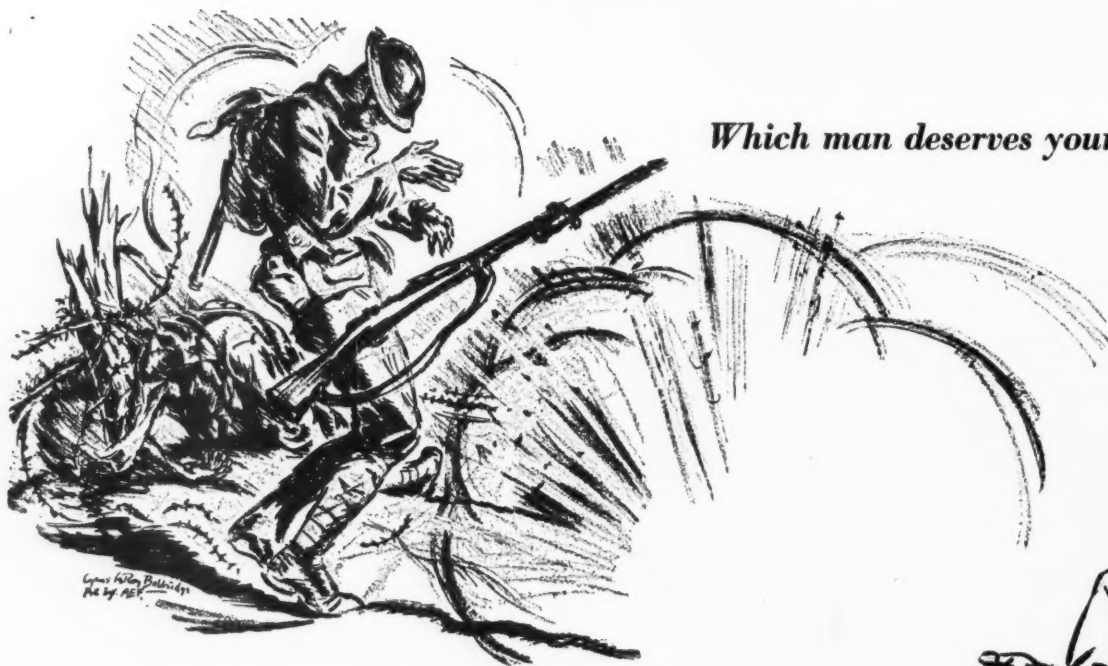


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Which man deserves your tax money?

Let's Kill the Pension Racket Now!

You Who Pay the Bills Read This

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WAR WITH MEXICO:—Last soldier died 1929. 415 widows still receiving benefits.

CIVIL WAR:—\$7,698,000,000 paid to date, with approximately \$98,000,000 present annual outlay. *All veterans and war widows entitled to benefits.*

SPANISH AMERICAN WAR:—\$811,819,000 expended to date. Annual outlay more than \$110,000,000. *Virtually all veterans and war widows entitled to benefits.*

WORLD WAR:—Record of constant liberalization. Number of beneficiaries increased more than 100 per cent from 1930 to 1932. Total mobilized in the war, 4,300,000 men. *Already—only 16 years after the Peace—over 1,900,000 claims have been filed.*

Here's How You Can Help Stop It!

The American Veterans Association, consisting solely of veterans, is fighting to protect and defend the rights of the *truly war disabled* and the *dependents of the war dead* against political exploitation.

We believe that Federal compensation in the form of war pensions should be restricted to:

1. *Those wounded in combat.*
2. *Those suffering from injury or disease incurred, in fact, in line of duty.*
3. *The dependents of those killed in action and of those who died of wounds, injury or disease incurred, in fact, in line of duty.*

If you believe in pension reform based on the *three-point plan* of the American Veterans Association, here is your opportunity to register your vote. Remember, you pay the taxes that pay the pension bill. Unless you are on the alert and pre-



vent a repetition of the pension rackets of the past, your great, great, great, grandchildren will be paying pensions for the World War in the year 2040. Fill in this coupon today and help to end the pension racket.

"Justice to the WAR WOUNDED • Justice to the WAR DEAD • Justice to the AMERICAN PEOPLE"

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Citizen's Vote

AMERICAN VETERANS ASSOCIATION, INC.
420 Lexington Avenue, New York City

Please record my vote in favor of the A. V. A. 3-Point Pension Program, and mail me, without obligation, your booklet "Let's Kill The Pension Racket."

Name.....
Street.....
Post Office..... State.....

Veteran's Vote

AMERICAN VETERANS ASSOCIATION, INC.
420 Lexington Avenue, New York City

As a veteran, I approve and vote for the A. V. A. 3-Point Pension Program. Please enter me as a member and mail me your booklet without cost.

Name.....
Street.....
Post Office..... State.....
Rank..... Branch of Service.....
War Service.....

This advertisement is made possible by a special fund raised in memory of men killed in action

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MUELLER PLAN

MUELLER and FHA is a combination that offers you a Banner Year in 1935—more heating business than you have seen in a long time, financed so you cash in on it promptly.

The Mueller Plan sweeps away the handicaps that have been holding up orders. Hundreds of home owners in your trade circle need new heating plants and air conditioning systems. Now they can get them, with the aid of the Mueller and FHA Plans.

The Mueller plan offers the customer No Down Payment—1 to 3 years to pay, in small installments—no delays or rigmarole. And you get your money immediately.

Write for details of this simple, sound Plan for making 1935 your Banner Year, with the Most Complete Line in the Heating Industry.

L. J. MUELLER FURNACE CO.

Dept. AA-2

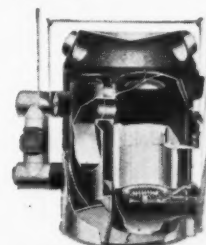
Milwaukee, Wis.



Mueller "F" Series
Mueller Full Front Furnace for volume business. Made in six sizes, both single and double door types. It's heavier—has higher "Standard Code" ratings—yet no higher in price. Also available in pipeless, three-way, and room heater types.



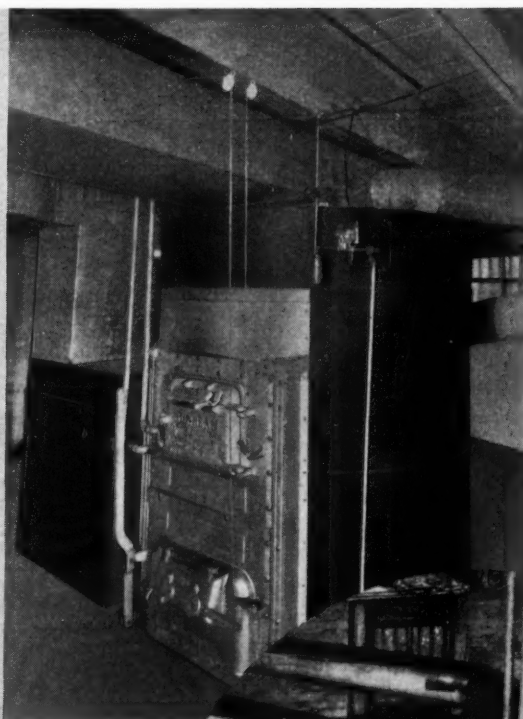
Mueller "A" Series
—all cast iron—for those who want the best in a coal or oil burning unit. Seven sizes—20" to 33" firepots. Also available with round galvanized casings.



All-Steel Furnace
Mueller all-steel, riveted and welded furnaces for coal or oil burner—seven sizes, 20 to 34 inch drums, including Giant Radiator type. Dome protected by cast iron bell.

MUELLER—MILWAUKEE

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Air Condi-
tioning Sys-
tem recent-
ly installed
in home of
Irby Turn-
bull, Boyd-
ton, Vir-
ginia.

*to replace worn out
furnaces like this →*

When Mr. Irby Turnbull, Attorney of Boydton, Virginia, made inquiries about having his old furnace repaired or replaced he was given the story about Sunbeam Air Conditioning. As a result, the Danville Plumbing & Heating Company sold him a Sunbeam Air Conditioning Unit complete with blower, motor, filters, spray humidifier and humidistat, and temperature control equipment. This order was placed through the Hajoca Corporation, Sunbeam jobbers at Danville, Va.

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"BEFORE" —
The old grav-
ity furnace
which was replaced by the Sun-
beam Air Conditioner shown
above.

Sunbeam Finance Plan Helped Close This Sale!

This substantial sale was financed through the Sunbeam Finance Plan. The dealer received his full contract price, without any holdback or endorsement, within a few days after the installation was completed. The purchaser was able to buy the finest type of system obtainable and pay for it over a period of years in small monthly payments.

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AIR CONDITIONING UNITS**

THAN ANY OTHER KIND!

The Fox Furnace Company, Elyria, Ohio

Please send information about Sunbeam Furnaces and Air Conditioning Units, the Finance Plan, and the name of the Sunbeam Jobber who serves my locality.

Name

Address

City State

A-2

Volume 104



Number 2

AMERICAN ARTISAN

Ring Around the Rosy

The one per cent assessment for financing our code seems to have developed into a game of Ring Around the Rosy. The ring has been formed so tightly that the industry must now await some Moses strong enough to break the vicious circle.

From all parts of the country come protests against the assessment. "It is too high." "We demand some accounting." "Who set this rate and where did the information come from?" "We won't pay!"

Strangely enough, it is from these same protestors that we are getting the loudest squawks against code inactivity; against the lack of progress.

We would like to inject a few pertinent thoughts. This code is OUR code. It is not Uncle Sam's code, or Franklin Roosevelt's code, or W. C. Markle's code.

If we honestly believe in outlawing unfair practices, why not get behind the code? If we are not sincere, then let's throw the whole thing overboard and put an end to this bickering.

If we want a code and better profits, its going to cost some money. That money won't come from Santa Claus, or Mr. Morgenthau, but out of the pockets of every contractor. That means we have got to pay before we can expect to get any advantages. We are not BUYING business profits—we are BUILDING business profits. And we have to pay before we build.

Some say—"I won't pay till all the rest pay." They say the same thing. Then the circle starts. Why not pay in escrow or under contract—but pay.

The men who establish the assessment were only GUESSING—one of the biggest guesses in history. They didn't even have an idea as to how much business this industry does in a year. Nor how many shops there are.

We have assurance from NRA that codes will cost just as little as possible. The cost has got to be low or codes won't be of value. Naturally, there are a lot of men who see in the code an undreamed of opportunity to set themselves into into a nice, fat job. Sooner or later those chislers will be removed, but time will be required.

As we stated several issues ago we can't see this code proposition as a national agency—right at this time. We should have started at the bottom, not at the top. If any city or a group of counties or a state wants code organization and compliance let that area organize, pay its costs, and reap the benefits.

If any area DOES NOT want to comply, then let that area alone. The idea of MAKING every area comply through some remote body is all wrong and can't be enforced in an industry like ours.

We earnestly think that enough talk has been done about this code. There's only one question—Do we want it or don't we? If we do, let's forget the Ring Around the Rosy business and get down to work. If we don't want the code, let's stop the argument and go back to the business of fighting the chisler.



Rip Van Winkle

Though most of us may be a little hazy as to time and place, we recall Rip Van Winkle as the man who went to sleep while the world passed by. Rip Van Winkles need not be per-

sons—it can well be an industry—the thousands of component parts of which insist on sleeping while opportunity slips away.

Our industry—the forced warm air heating industry—has been guilty of doing a Rip Van Winkle. Our sleep comes upon us practically every winter when, like the bear, we insist on hibernating from the time fires are well started until fires are out.

We are letting a splendid opportunity get away from us!

What better time is there to sell forced air heating than right in the middle of the winter—in the coldest, windest weather—an ideal condition for convincing the owner that those cold rooms can never be satisfactorily heated unless forced circulation is applied?

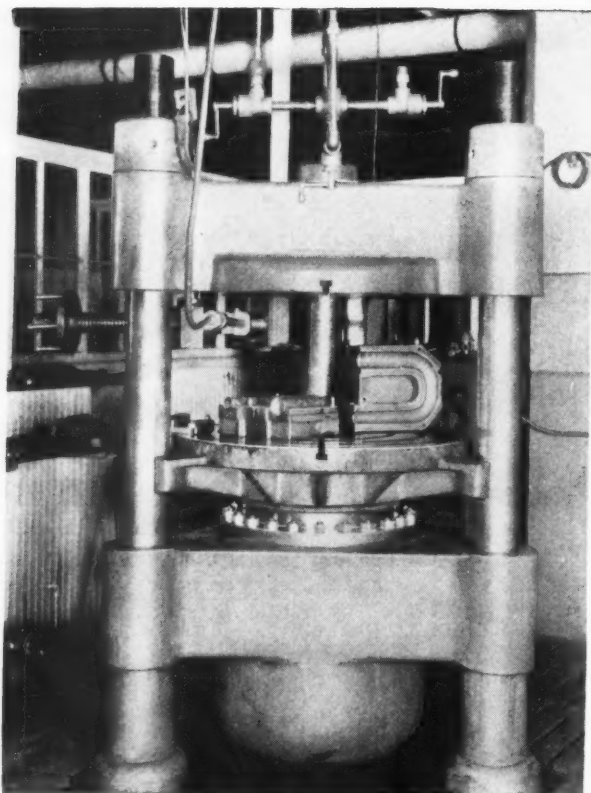
What better time is there than dead winter to sell air circulation, elimination of draft, stratification, cold corners, sluggish response from the heating plant?

What better time is there than December, January, February, March, to demonstrate the advancements made in modern forced air heating and to prove how illogical it is to try and "get by" with a heating plant which never was designed or installed for the job to be done.

From several sources comes a plea to end this foolish habit. Other industries have abolished the idle winter period—if they can why can't we?

Surely the sale of better heating systems—and the accompanying sale of modern apparatus—need not stop altogether just because the home owner has a fire in his furnace.

Smart contractors long ago discovered that the winter time can be made one of the most profitable seasons of the year. People don't have to have increased comfort pictured to them—they have discomfort dogging their footsteps.



The Manufacture of Band Instruments

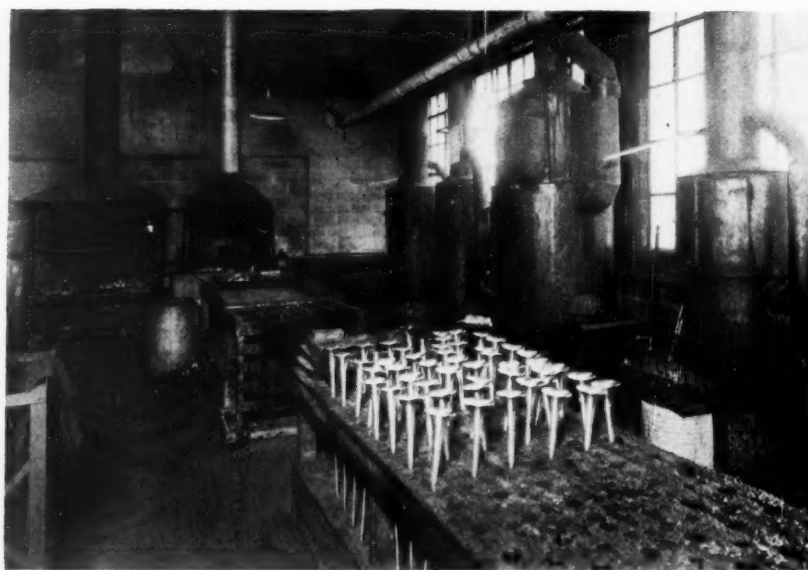
"What thrilling march music" or "That d—n saxophone" may be your sentiments on wind instruments, but no matter how you regard them their manufacture is chiefly a mass sheet metal fabrication problem and the methods used are not much different from the practices in your shop.

At the left above is the special hydraulic press which expands strip metal to horn shapes. Below is a view of the pitch room where straight tubes are filled with pitch, heated and bent.

WITH an old sewing machine serving as an improvised lathe, C. G. Conn founded the business to make musical instruments back in 1875. Three times fire has destroyed the factories of this company, but they were always rebuilt immediately. Now two great buildings house machinery and equipment where upwards of one thousand workmen produce close to 3,500 instruments monthly.

In one division of this factory 125 different kinds of horns are produced; 510 parts go into the making of a single saxophone and 60 operations are required in the manufacture of one of the valves of a trumpet. The design and development of one perfect master model of each instrument, entailing years of experiment and the expenditure of huge sums of money, is in itself a remarkable achievement, but it is an even more difficult task to tool and man a factory division that will duplicate this master model with faithful accuracy, in large quantities.

One of the interesting processes in the making of band instruments is the great hydraulic expansion press by which horns are perfectly formed. It consists of a set of steel



dies the exact shape and size of the horn, and, after the partially formed horn of sheet brass is inserted and locked in, it is expanded into the dies by water under terrific pressure. Not only is the tubing and horn formed with absolute accuracy, but a glassy-smooth inside surface for supporting the delicate tone waves is also produced. By the old method the taper branches were filled with lead or pitch and then hammered to shape by hand.

The raw material for making horns and trumpets is brass sheet or tubing, silver and gold plated.

Flutes are made of solid silver, clarinets of wood, springs and screws in the water keys are of monel metal and trumpet valve springs are of phosphor bronze, while springs of gold are used in flutes. The factory route sheet for a "Bell, Bent Trumpet" reads as follows: Material, 11 in. x 24 ga. 70/30 Brass.

1. Cut stem.
2. Form, notch, join, anneal, pickle, dry stem.
3. Apply flux and spelter, braze stem.
4. Roll stem.

5. Anneal, pickle and dry stem.
6. Apply flux and spelter, braze round seam.
7. Anneal.
8. Spin:
Spin, draw, trim, spin, cut wire, spin in wire, solder wire, trim solder.
9. Strap, polish, polish rim and buff.
10. Ball, anneal, plug and fill, Saw.
11. Unplug, bend and empty and Press.
12. Clean and finish.
13. Strap and polish.
14. Grease and Buff Bell Stem and Crook Stock.

Amplifying the foregoing the forming is accomplished by putting the brass blank through rolls which give it the proper curvature to bring the two long edges together. These edges are then notched and joined in a seam after which the whole is annealed with a gas torch followed by pickling and drying. Brazing of this seam is done with a gas torch and the seam is hammered. The stem thus formed is then put on a stationary mandrel and the seam is reduced to the thickness of the stem wall, by a roller operating back and forth under pressure.

The bell, which is blanked and formed in a punch press in three operations and annealed with a gas torch between each operation, is fitted to the stem and the seam



Stems are seamed and brazed and drawn progressively until exactly the specified section is produced. Use of gas heating devices serve to speed production and maintain a high degree of workmanship.

brazed with a gas torch. The seam is reduced by an air hammer to a uniform thickness. A portable mandrel is next placed in the bell and both are placed in a vertical press where they are forced through a lead plug with a hole, at the start, no larger than the small end of the stem. The stem is annealed between each operation and the bottom finally notched to receive the bell. The assembled unit is then chucked in a lathe where it is spun, to smooth and true, and wire spun in beaded edge and then soldered. Chucked again the solder is smoothed off.

This straight trumpet, finished except for plating and polishing, is

stocked, and is drawn from stock as needed to make any of four or five different kinds. Those to be bent or curved are taken to the pitch room, where they are lined up on racks with the small ends down and sealed with corks and hot pitch poured in. Here are located long rows of pitch kettles heated with gas burners. As soon as the pitch has solidified the trumpet is pulled into the proper curve on a bending machine with interchangeable dies. The pitch is then melted out with a gas torch and the curved trumpet finished.

Large parts to be bent or curved, such as branches and bows for large horns, are placed in cast iron dies and lead balls are forced through. These balls and rings are melted for use again in lead melting pots. While silver is used where hard solder is necessary a soft solder is also employed which is made up of equal parts of lead and tin.

Strap polishing, as the name implies, consists of holding the parts against a swiftly rotating abrasive strap, looped about two pulleys like a band saw.

Much of the work on wind instruments, however, remains to be done to the small parts such as valves, keys, etc. Here, again the route sheet shows as many as 29 operations for completion.



A welding section where parts of horns are put together by gas welding. Stems are brazed to bells which have been seamed and brazed previously.

The Design and Operation of a Paint Spray Booth

By J. W. Baybutt

Instructor, Rochester Athenaeum and
Mechanics Institute

Paint spray booths constitute a much used industrial application of blow pipe and collecting system principles. The article explains how the particular problems of one booth were accounted for in the design and how the booth was fabricated.

THE writer was called upon recently to design a paint spray booth for a large foundry. The material to be sprayed consisted of castings of various sizes which were to be conveyed from the foundry to the assembly room on an overhead trolley track. To facilitate production it was decided to have the painting done without removing the pieces from the hooks so the hood design was made to conform to this requirement.

General Design

Fig. 1 shows the plan of the booth with the arrangement of the track and switches, Figs. 2 and 3 being the front and side elevations, as noted. The doors installed on both ends were double hung with double swing hinges and manual pulls for use when desired. The trolleys were equipped with curved push bars as shown in Fig. 4, to operate the doors so that the newly finished work would not contact the door surfaces. Removable eliminator assemblies for both sides of the hood were made up as shown in sections, noted in Figs. 5, 6, 7. This assembly was made with bolted connections so that the plates them-

selves could be removed from the channel frame and easily washed with solvent to remove paint residues which, of course, gradually build up during the operation.

Piping Design

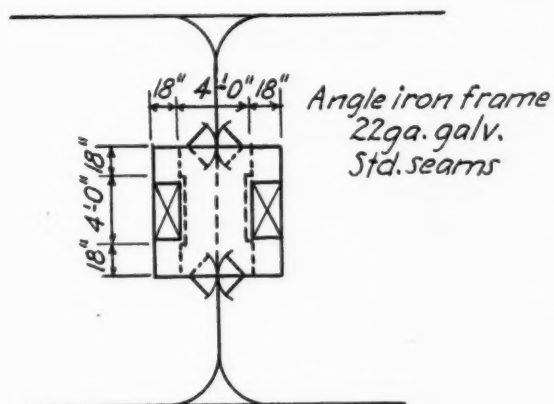
The piping from the hood was made large resulting in low air velocities so that there would be a minimum resistance for the fan to work against. The fan used was of the propellor type with extended shaft as shown in Fig. 3. This type was considered preferable on account of minimum resistance to air flow and the fact that no bearing or belt trouble would result from paint contact. It must be remembered, also, that in this class of work the resistance that the fan must work against will tend to increase if the system is not carefully serviced, so the fan design should be of the type that a motor underload will result rather than an overload with increased resistance. The outlet through the roof was run high enough so that an 180 degree ell was installed, the outlet being directed vertically down on the roof. In this particular case any paint spray that was carried with the air did not

have any detrimental effect to the roofing material.

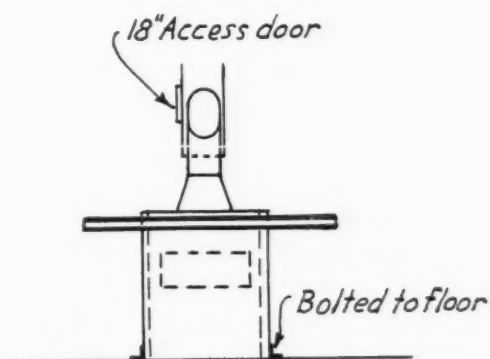
If a more effective paint eliminator is desired than previously mentioned and shown herewith, an alternate design shown in Fig. 8 may be resorted to. This scheme incorporates a sheet metal frame made up of a light gauge metal housing with say one inch mesh chicken wire front and back. The front of this unit is hinged to facilitate changing the filter material. Many types of filter material have been used in this design, probably the cheapest one being ordinary excelsior. If excelsior is used, however, care must be taken to change to new materials often as spontaneous combustion may result if this is not done, depending on the analysis of the paint material. With excelsior the writer has recommended sprinkler heads be used if the operation of the booth is in an important position in the plant.

In the case in question the hood was to be used with only one operator so that only the front or the back door would be open at any one time under ordinary operating conditions. On this basis about 22 square feet of door area was open through which a definite air veloc-

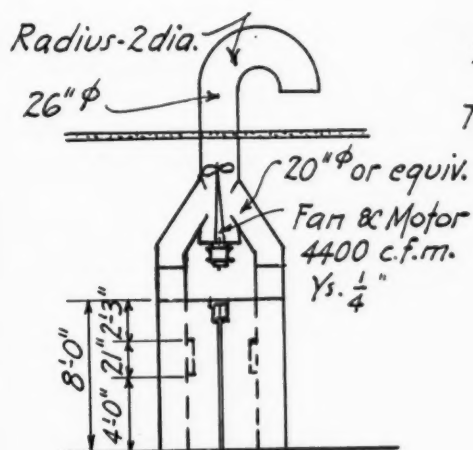
SPRAY BOOTH



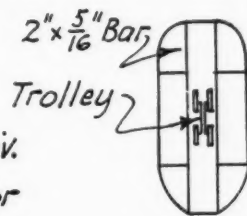
- Plan -
Fig. 1



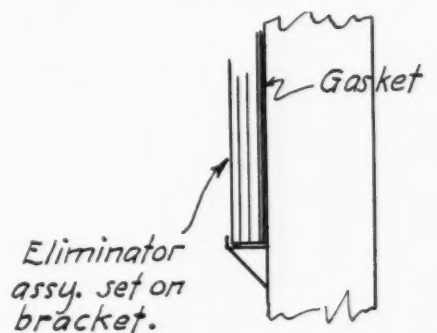
Side Elevation
Fig. 2



- Front Elevation -
Fig. 3



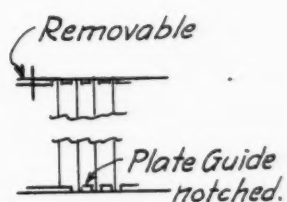
- Plan -
Fig. 4



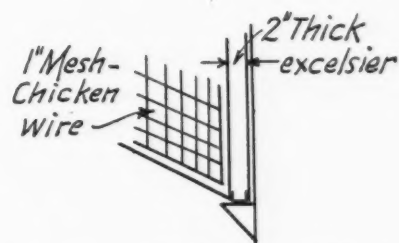
Sectional Elevation
Fig. 5



- Plan -
Fig. 6



- Elevation -
Fig. 7



- Side Elevation -
Fig. 8

This drawing shows all the details of the booth. Especial attention is called to some of the details such as the doors, trolleys, and eliminator assemblies.

ity has to be maintained to prevent any back flow of paint fumes. In the writer's experience, a velocity of 200 feet per minute is a reasonable velocity to use with this type of equipment. This would then mean that the fan would have to handle about 4400 c.f.m. The gross

velocity through the plate type eliminator should not be less than 300 feet per minute. This would require 15 square feet gross area of eliminators, resulting in $7\frac{1}{2}$ square feet for each side of the hood. These eliminator assemblies were made up about 21 inches high

and 4 feet long centered on the hood in plan and the bottom set about 4 feet from the floor. For certain types of work it may be well to change the face dimensions of this eliminator assembly to square shape and locate in plan to fit the size of the articles to be painted.

Indiana Discusses Codes, Business Prospects, Present Problems

CONTRACTORS from all parts of Indiana gathered at the Hotel Antlers, Indianapolis, January 22, 23 and 24 to hold the sixteenth annual convention of the Sheet Metal, Warm Air Heating and Roofing Contractors' Association of that state. Interest in code work, developments in air conditioning and an increased optimism due to a good fall and winter business brought out the largest registration in several years past. As customary, a display of manufacturers' products was staged with every space taken by manufacturers and distributors showing familiar products and many new materials and items.

Some aspects of code application and a discussion of problems of enforcement were brought out in the first morning's session led by J. A. Harris, South Bend, and Chairman, State Code Administration Board. Mr. Harris brought up such problems as getting contractors interested in code compliance and getting contractors to pay the assessment. His review was supplemented by comment from members of the state board and contractors from organized and unorganized districts.

Welding

Welding, its apparatus and problems, was the subject of a brief talk on Tuesday afternoon. The speaker, H. E. Menefee, used a standard set of gas burning equipment to demonstrate various flames for cutting, welding, brazing with common materials such as black iron, aluminum, stainless steel, and heavy plate. The members took advantage of the speaker's offer and asked numerous specific questions relating to use of welding and cutting apparatus in every-day shop jobs.

The chief discussion of the first day's meeting centered around the code. W. C. Markle, treasurer of



ELMER LIVEZEY
President

the National Code Authority was present. Mr. Markle outlined some of the recent developments in code work and then opened the discussion for questions. Among the facts brought out are the following:

Code Rulings

Arrangements have been made for contractors to pay their assessment on a monthly basis rather than quarterly.

Agreement has been secured for assessments to be graduated according to area. If any area is able to secure 90 per cent compliance at a

low cost the assessment for that area will be reduced to the point to cover area expenses and no more.

Conversely, if any area requires extra money due to high costs of enforcement that area's assessment must be increased to cover the higher cost.

NRA has ruled that code work and association work must be absolutely divorced. There must be no connection between code and association officers and no connection between association dues and code assessments. No association will be permitted to collect a set sum of money to apply to both code assessment and association dues.

NRA has in mind eventually turning code work over to associations, but to date no association has been found to meet all requirements of NRA.

NRA is jealous of the consumer's welfare, something most codes have lost sight of. More attention must be paid this in the future, particularly where code rulings tend to increase prices.

Wage rates must be established at advertised public hearings with both employers and employees in attendance. Wage rates must be low enough that the consumer is protected. This has been a stumbling block in some areas where the unions have attempted to increase rates beyond the point where the rate is justified.

In areas where contractors won't get together, nothing can be done at this time because code establishment must be by general agreement.

At an advertised public meeting code committees and wage agreements can be established by a minority of the contractors in the area and the majority can be made to comply.

Business Prospects

The Thursday morning session was given over to a discussion of business administration, led by editors of the trade papers. The general aspects of the business picture were divided up between the speakers so that all phases were covered.

Matt Friedman, National Sheet Metal Contractor, advanced the idea of keeping abreast of progress



R. A. HUNCILMAN
First Vice-president

and cited as examples the blacksmith and the phonograph manufacturer who watched wholly new businesses pass them by.

"Contractors must watch the changing market," declared the speaker, "for in this age no market is stable for very long. Work which may constitute the bulk of any shop's operations today may be entirely gone tomorrow. For example, heating used to be largely a proposition of residential work. Today all types and sizes of houses are turning to forced air and, in addition, commercial establishments, apartments, industrial plants look favorably on this system.

"We see today invasion of our heating field by some of the largest corporations in the country. These organizations pay little attention to our established means of distribution. They prefer to use the kind of high pressure outlets they are using on other products. Time may teach them that these purely sales outlets can't do the job of heating, but until this is proved much business will be lost to us."

Changes in Our Field

J. D. Wilder, AMERICAN ARTISAN, carried forward this general theme and pointed out specific instances of our changing market. "On every hand we hear discussion of the New Deal," stated the speaker. "In our grandfather's day this used to be called the New Day. And just as occurred thirty or more years ago, the New Deal and the New Day are found to be 85 per cent conversation and 15 per cent actual advancement. These new deals and new ideas go forward on the tide of talk."

Pointing out specific examples of change in operations, the speaker cited exterior metal work. "We may not see another era of Chrysler buildings for a long time. Meanwhile outside metal work will go on with new materials and new ways of using metal. Most of this work will be remodeling; the adding of new metal fronts to old buildings, metal trim, marquee and weather protection by flashing and capping.

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"We should also witness the increased use of metal on interiors. For instance residential basements ought to be a large field for metal ceilings as basement recreation rooms become even more popular. In connection with interior work, we have only begun to feel the public's increased interest in ventilation. Many of the people investigating air conditioning will eventually buy ventilation, because ventilation is all many buyers need. We should see ventilation expand to common adoption in all kinds of commercial establishments, homes, factories, industrial processing plants, below ground level spaces and others.

"Many large and small shops have turned to the fabrication of certain metal specialty items. The range of items fabricated covers practically every conceivable product. So we find furniture, cabinets, boxes, tanks, kitchen and hotel equipment along with hundreds of smaller items in common production all over the country.

"We hear so much about air conditioning, we often tire of more conversation. However, one thing looms out—we must give increased attention to those problems which effect customer comfort. For instance, cold glass areas, floor drafts, air change, temperature differential between floor and ceiling, are a few problems we have overlooked in our anxiety to learn all about effective temperature, c.f.m., etc."

E. C. Carter, Snips, called attention to the need for more education of contractors in advanced heating

principles. The speaker cited his experience with a school some ten years ago where the Standard Code was being explained. Furnace men quickly dropped out of the classes while salesmen and utility representatives stuck until the end. "There is urgent need to watch tax legislation," declared Carter, "for governing bodies everywhere are looking for new classes to tax. In Chicago tax assessments in the form of licenses were recently introduced and would have gone through had Chicago associations not appeared and protested."

An example of new fields of work was cited from Detroit where several firms are now doing caulking in houses where there are leaky window and door frames. Better business records are needed, declared the speaker and showed some cost and labor cards now in use. Advertising by the individual and by contractor groups is needed and is being carried on successfully in many localities.

Big Firms Coming In

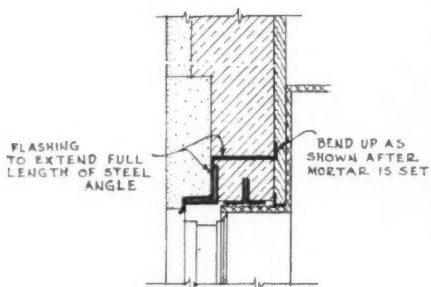
Frank Meyers, Owen - Illinois Glass Company, completed the business administration discussion, speaking on chain store competition. Chain stores have compelled merchants in every line to change their ways of doing business. So it will have to be with us, we can't kill chain store competition, nor can we regulate it out of the field. Much of the present activity against mail order houses is short-sighted in that if our manufacturers do not sell the mail order houses, these firms will establish their own source of supply. Control of the final selling price is the thing we are really interested in.

The speaker advanced the idea that our heating field is now witnessing the ingress of many large corporations, new to the field. Competition from these firms is and will be extremely aggressive and most such firms will attempt to establish their own controlled outlets through firms not now in the heating business. Such change may result in

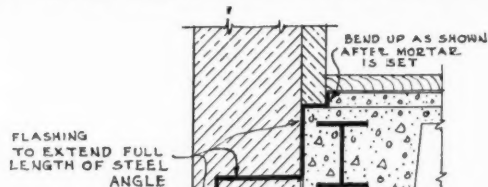
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Weather Protection— Some Late Specifications

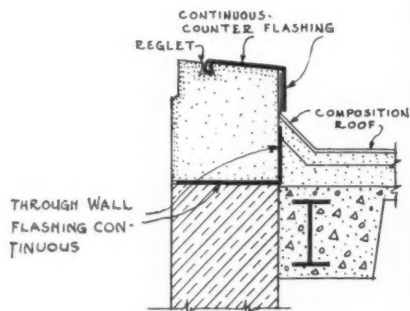
"New Buildings Will Be Better Protected" (in other words, better flashed) has been widely heralded of late years. Sometimes overlooked is the fact that old buildings, too, need this better protection and the sheet metal contractor should do the work.



DETAIL AT
STONE LINTEL

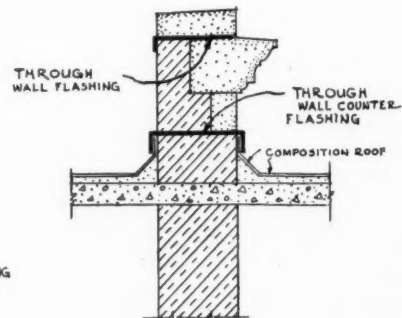


DETAIL AT BRICK LINTEL
WHERE CONCRETE BEAM OCCURS



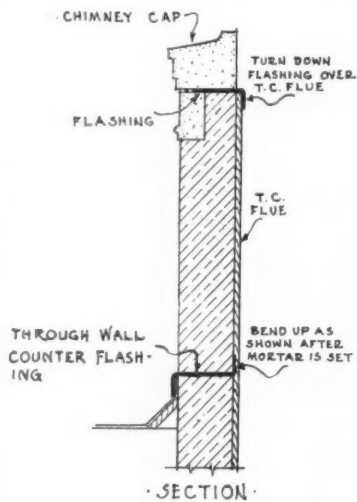
DETAIL AT
LOW PARAPET

Most of the details on these two pages are taken from Treasury Department specifications for Federal construction. The aim of these specifications is permanent protection against moisture seepage and destruction.

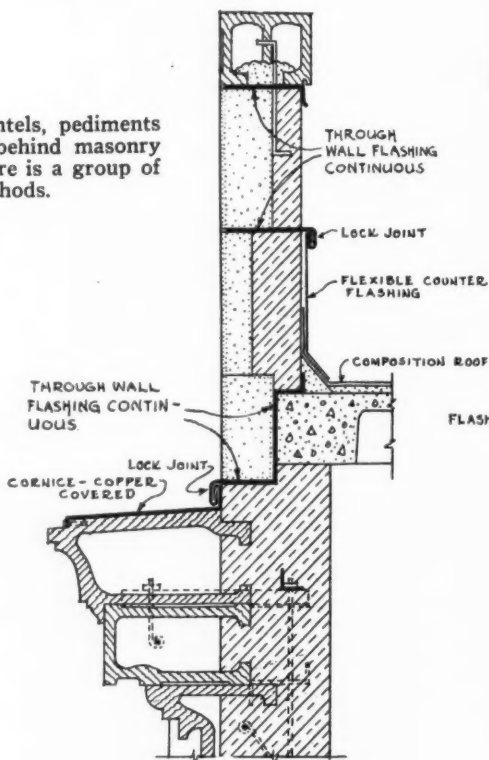


SECTION WHERE TWO
LOW ROOFS ABUT PARAPET

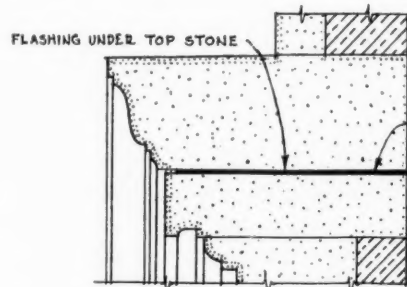
Copings, chimneys, cornices, lintels, pediments are places where water seeps behind masonry and destroys the structure. Here is a group of "better flashing" methods.



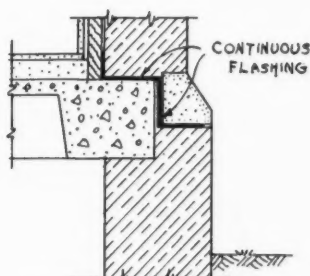
DETAIL OF CHIMNEY
AT CAP & ROOF LINE



DETAIL AT TERRA
COTTA CORNICE

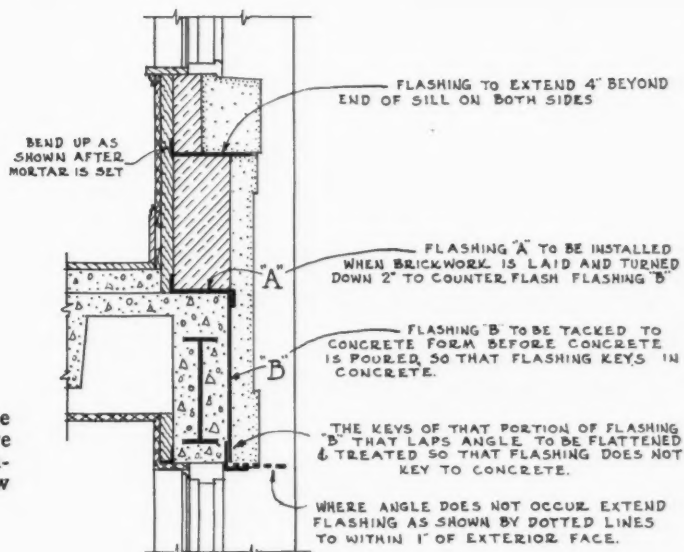


DETAIL AT TOP OF
STONE PEDIMENT

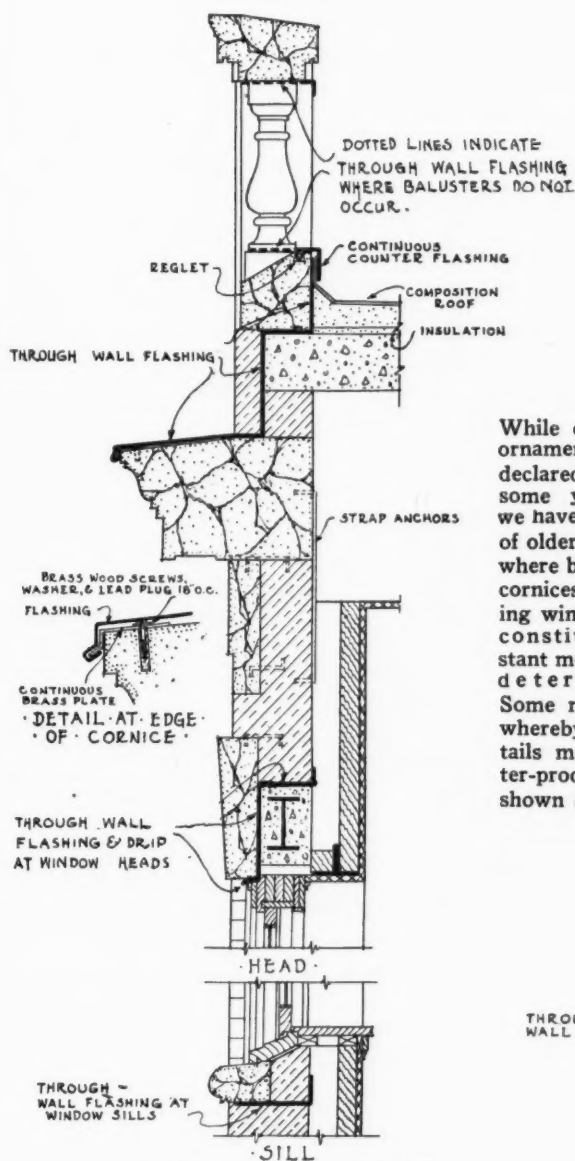
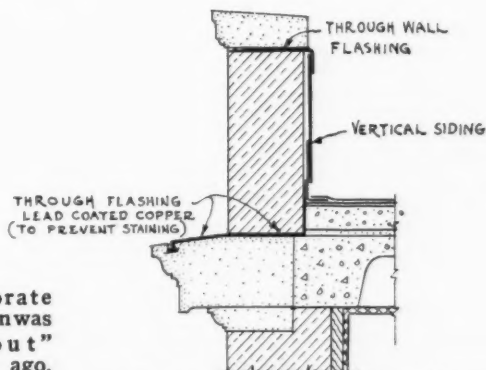


DETAIL AT WATERTABLE

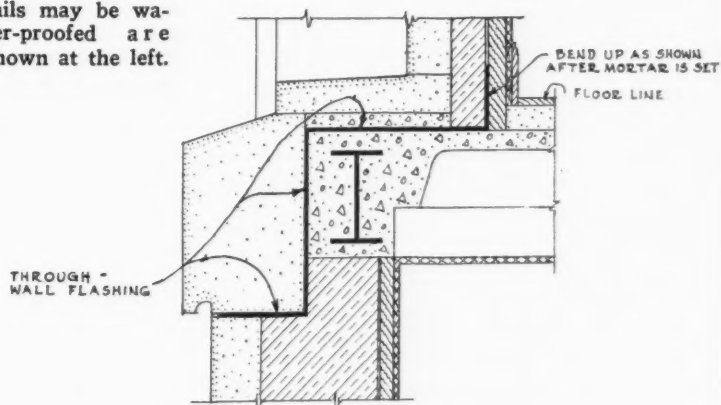
Watertables and spandrels (especially the thin masonry and metal spandrels), require careful flashing to insure against faulty masonry work. The two details here show recommended protection.



STONE . . . SPANDREL

DETAIL AT BALUSTRADE
CORNICE & WINDOWDETAIL AT PARAPET SHOWING
USE OF VERTICAL SIDING

Inside walls of parapets (above) are frequent sources of expense to roofers and owners. Proper flashing and siding will eliminate the trouble. Below is a detail for a belt course, another source of trouble.



DETAIL AT BELT COURSE

While elaborate ornamentation was declared "out" some years ago, we have thousands of older structures where balustrades, cornices, projecting window heads constitute constant menace from deterioration. Some methods whereby such details may be water-proofed are shown at the left.

An Insulated Oven Designed to Save Weight and Reduce Heat Loss

The fabrication and erection of industrial ovens is not new to the sheet metal industry. However, the idea of using the new foil-type insulation between two thin sheet iron walls to reduce weight and also reduce heat loss is new. The Super-Steel Products Company, contractors, handled all details of design, fabrication and erection. The oven is used to bake painted articles.

THE drawing accompanying this article shows details of an interesting sheet metal fabricating project entailing the erection of a large oven and the insulation of the sides, ends and top. Since many contractors are called upon to fabricate ovens and because insulated ovens are coming to be highly important in many industries, a description of this oven may prove interesting.

The particular oven in question was designed, fabricated and erected by Super-Steel Products Company, Milwaukee sheet metal fabricating contractors.

Old Ovens

The history of the job illustrates how installations of this type are frequently lost because the contractor has no new idea to explain to offset established precedent. The company buying this job had been using ovens of this general type for many years. These ovens had always been made of heavy iron plate to prevent buckling and sagging under high interior temperatures. Using heavy plate it had always been necessary to place the ovens on the already

crowded floor because of the weight.

Several attractive ideas were incorporated by the Super-Steel Company in submitting their design. First, the oven could be fabricated from light weight galvanized sheets, thereby reducing the total weight so much that the oven could be suspended from the roof structure. This permitted use of the floor below—impossible before. Secondly the oven could be insulated so that the previously high heat losses could be conserved.

Need of Insulation

To install such an oven it was necessary that the light weight walls be thoroughly insulated and that the total weight of sheet and insulation be as little as possible so the oven could be suspended.

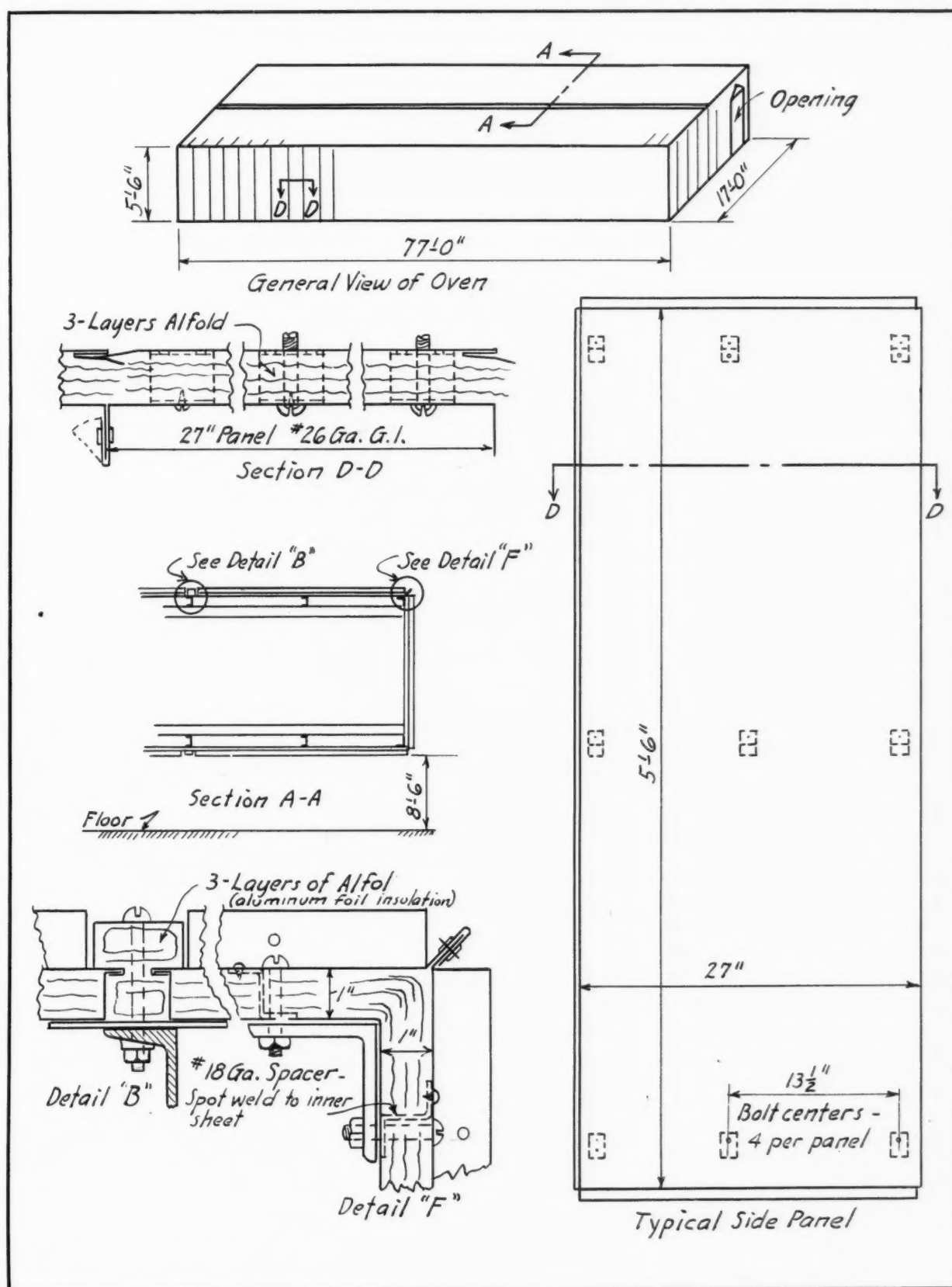
As shown on the drawings, the oven is some 17 feet wide, 77 feet long and 5 feet 6 inches high. Approximately 10,000 pounds of galvanized iron were required. The oven was fabricated in panels as shown—mostly 27 inches wide and 5 feet 6 inches long. Each panel was fabricated into a complete unit—outside and inside

sheets, held apart by spacers (see detail F). Between the two sheets three layers of aluminum foil insulation were placed as shown in details B and F. These two details also show construction of panel corners, spacers, channel hangers. Details of side panel construction are shown in detail D-D. Other details in the drawing show important features of the design.

The Insulation

It may be of interest to note that this type of insulation can be used for an application where the thin sheets of foil must be suspended between two walls. It is not necessary to stretch the foil sheets tightly, but each sheet should be clear of the other sheets. This foil material gets its insulating qualities by reflecting heat rather than preventing heat to travel through, hence the spacer bolts on which the foil is hung.

This particular oven is used to dry paint jobs. The interior temperatures range from 200 to 300 degrees. The insulated panels reduced the heat to 100 degrees on the surface of the outside galvanized sheet.



This one drawing contains the plan, elevation and details of the design and construction. The details are of particular interest because of the newness of the insulating material. Note how the thin sheets of foil are suspended between the sheet metal walls. Ingenious methods were required at corners, hangers and structural steel framing points.

6 Months Experience With Our Code

By B. F. John
Philadelphia

The industry has been hearing of Philadelphia's progress under code regulation. Perhaps better than any other community, Philadelphia is in a position to explain the code's value and disadvantages. The author is well known in the industry and is also a code authority committeeman.

WHATEVER the faults found in the Code, we who have studied and watched it in action locally for the past six months cannot help but discover so much that is good for the industry that he would unhesitatingly give approval. And he would find that the Code may be added to, deducted from, or altered whenever it works a hardship on the trade. Already some exceptions have been granted.

To those of us who have worked with the Code since May 25th it stands as a Charter of Liberty from the questionable practices that have crept into the industry and caused many men to damn each other and the industry in general. The Code offers a Constitution and By-Laws; Code of Ethics, or Rules and Regulations, as you wish to call it, for the proper conduct of business, and includes a wholesome "SWIFT KICK" for those who will not play fair.

Those who have just read the Code over or just listened to some one else's biased explanation, cannot hope to understand its purpose. To them it seems a confusion of new ideas hastily put together. In reality, it is the result of years of study to wipe out the deplorable condi-

tions that have grown up because of lack of attention and co-operative spirit.

Let the fair minded contractor write down those things from the Code that he believes will aid his business, and those which compel others to do business fairly. Then judge the Code's value. There are foolish men who have stubbornly refused to study the Code or enter into a discussion of its merits and refused to abide by it, until they were taken by the "scuff of the neck" by the Federal Court.

What the Code Will Do

The enforcement of Code provisions must be a local matter. All that is needed is to apply for permission to organize a Board under the rules of code compliance. Let it be known to everyone just what they can and cannot do.

Some of the things we find the Code offers are as follows:

1. A penalty for each violation of the Code.
2. Every shop or individual MUST register.
3. The hours of labor are 40 hours a week and 8 hours a day, with some exceptions.
4. Each competitive area may

nominate, elect and have approved an Administrative Board for the purpose of Code Compliance; with power to compel adherence by law, of the entire trade.

5. Our committees under the code have been able to settle disputes among the trades, and review and settle disputed contracts.

6. Unfair and unjust competitive bidding is rapidly being eliminated, through our Bid Depository. Under certain rules and regulations this depository has given much satisfaction and with present experience may be improved later.

7. No contractor shall directly or indirectly sublet to any employee or laborer the labor services required by any contract secured by such contractor.

8. Every contractor, working singly, or any part-time employee working for himself, MUST comply with the Code provisions in full.

9. All members shall estimate costs in accordance with the cost system adopted. This is for the purpose of preventing anyone from working below cost. (This with No. 10 that follows will prove the greatest step taken by our trade in all its history.)

(Continued on page 48)

The Wisconsin Convention

The 1935 Annual Convention of the Sheet Metal Contractors Association of Wisconsin, heard one of the best programs staged in several years. Timely subjects, intelligent speakers, plenty of time on the program, made the meeting enjoyable. Some of the important matters discussed from the floor are reported here.

AN exceptionally good program of speakers and subjects was presented at the 1935 annual convention of the Sheet Metal Contractors' Association of Wisconsin, held February 4 and 5, in Milwaukee.

Zinc Coatings

The subject of zinc coating on sheets was presented interestingly by George C. Bartells of the American Zinc Institute, New York City. Mr. Bartells used the stereopticon machine and numerous samples of galvanized iron sheets to demonstrate the advantages of heavy coatings. He outlined the zinc institute campaign to popularize heavier coatings on sheets. "The result is that most manufacturers," declared Mr. Bartells, "can now furnish sheets having at least two ounces of coating to the square foot. This means one ounce of coating on each side of the sheet." The speaker outlined the investigations wherein samples of galvanized iron sheets are removed from actual buildings in all parts of the country and taken to the laboratory for tests to discover just how much zinc coating remains on the sheets.

Mr. Bartells said that the life of a sheet is directly proportional to the weight of coating and the principal idea of heavy coating is to eliminate and avoid rust. Many sheets which show rust are actually not perforated and will serve for many years. He pointed out, however, that most owners do not like the bad appearance

brought about by rust.

Val. W. Ove, of the Apollo Metal Company, LaSalle, Illinois, introduced Mr. Samuels, sales manager of the Apollo Company, who explained Apollo metals and outlined some of its sales possibilities. A large display board held samples of crimped, etched and fluted finishes of Chrom-Copper, ChromZinc and Chrom-Steel. The method of electroplating copper and steel sheets by depositing thereon a thin film of chrome, was explained by Mr. Samuels.

Suitable Uses

Mr. Samuels very frankly pointed out that ChromCopper and ChromZinc are best suited for interior work and where severe weathering is encountered the contractor had best use stainless steel. In answer to a question from one contractor, he declared that such items as worktables should be fabricated with the chrome material for decorative purposes and a hard stainless steel for the working surface. Photographs were passed around showing typical interior decorative applications of ChromCopper and ChromSteel. Mr. Samuels stated that when passing the sheet through the brake the paper which comes on the finished surface should be left on the sheet until all forming operations are completed. The nose of the brake should be kept just as round as possible. Where soldering must be done, the soldering should be done on the dull side, if possible. Where the

soldering must be done on the finished surface cover the part of the sheet not affected by the hot iron with vaseline and apply acid from a muscilage brush to the surface which must be soldered.

Stainless Steel

D. T. Haddock, consulting engineer, American Sheet & Tin Plate Co., Pittsburgh, addressed the convention in the afternoon on "Stainless Steel in Various Industries." Mr. Haddock explained the term 18-8, meaning a material possessing 18% chrome and 8% nickel. This particular 18-8 combination, declared the speaker, is the commonest form of stainless steel used in the sheet metal fabricating and architectural sheet metal fields. "The history of stainless steel development," declared Mr. Haddock, "has been a history of removing impurities. Many men have contributed to the progress made to date. Chrome ore comes from Rhodesia and one company reduces the ore to ferric chrome which costs from \$350 to \$400 a ton."

Mr. Haddock declared that—"the three big fields for use of stainless steel are: where corrosive conditions are encountered; where catalytic action is likely to occur and in decoration and food industries where usage is severe and where a polished sheet must be employed. Many industries, such as the varnish, dye, meat packing and milk industries, are large users of stainless steel. One of the newest uses of 18-8 is for exterior work,

such as the Zephyr train. Stainless steel can be soldered but the acid should be washed off immediately. Bad soldering can be cleaned up by scrubbing the soldered surface with an abrasive, such as pumice. Steel wool should not be used since particles of steel wool cling to the sheet and rust making it appear as though the stainless steel itself had rusted. After all soldering operations the sheet should be washed with a solution of nitric acid not hotter than 120 degrees F. Stainless steel can be electrically or gas welded without great difficulty since the material is not especially conductive of heat."

Insurance

W. E. Kruenen, Hardware Mutual Casualty Company, Stevens Point, Wisconsin, discussed "Public Liability Automobile Insurance." Mr. Kruenen cited changes in Wisconsin law which require every employer of three mechanics or more to carry compensation insurance. Employers of less than three men can set up their own reserves. "Losses due to accidents are increasing in all lines of business," declared the speaker. "Truck liability is especially important now because trucking accidents seem to be on the increase." The speaker recommended insurance of \$15,000 to \$30,000 rather than \$10,000 to \$20,000 as higher allowances are being awarded by the courts.

The Code

H. H. Anderson, of the state compliance office for NRA in Wisconsin, was the first speaker Tuesday morning. Mr. Anderson outlined the progress of general code organization and compliance in the state.

Mr. Anderson pointed out that NRA has recently ruled all contracts must be awarded by the awarding authorities within twenty days of receipt of bids. If an extension is made all bidders must be advised of the extension

and an extension can be granted only if two bidders agree on the length of the extension. According to a recent ruling, farmers can do their own work on their own property.

Wisconsin Sentiment

Some idea as to the sentiment of contractors out in the smaller communities of the state was indicated on the convention floor by Chairman Holming, who declared that the Code has accomplished practically nothing for Wisconsin contractors because without associations backing the activity no organized effort can be made. Mr. Guessenhainer explained that in an industry such as ours comprised of hundreds of small operators in towns of all sizes and where an active organization has never been perfected, it is practically impossible to sell contractors on the value of the Code.

Blow Piping

C. H. Jackson, vice-president, Blower Application Company, Milwaukee, discussed dust collecting problems. "The primary problem is to determine the speed and horsepower for fan and motor required to move any material. These two factors are determined by the required cubic feet of air per minute and the static pressure in the collecting system. Too big a system penalizes the owner for power, while too small a system means trouble.

"The determining of the required amount of air has been worked out for all sorts of materials under all sorts of velocities by years of experience and has been charted in tabular form by fan manufacturers.

"It is perfectly possible to design several radically different systems to do the same job and each such system may work out as intended. The hood is important and must fit the job."

Filters

Frank L. Myers, Owens-Illinois Glass Company, Toledo, Ohio, spoke on "Air Filters and Their Applications." "There is general public acceptance of the need for clean air," declared Mr. Myers, "and the field for air filter application is expanding rapidly."

Referring to the problem of selecting the proper kind of filter, Mr. Myers declared that any filter is a compromise between maximum efficiency and resistance. "A good filter must have a reasonable length of life. This means that the dirt holding capacity must be as large as possible, but the efficiency should not be so great as to quickly pack the filters. Filters operate on two general principles—screening and impingement.

"The problem of selecting the proper filter should be determined on the basis of estimating how much air loss the job will stand. Most jobs will stand a 15% increase in resistance without materially affecting air delivery.

"If adhesive is used in the filter, such adhesive must be useful all the way through the filter, and the adhesive must be active all during the length of time the filter is in use. It is essential that the adhesive material be able to hold dirt and dust as the filter approaches its maximum life."

Mr. Myers declared that commercial establishment ventilation, particularly small establishments such as drug stores, looks to be one of the coming fields. Mr. Myers declared that filter manufacturers are working out designs so that each type of filter would be efficient under a range of velocities.

Education

J. A. Van Alsbury, Chairman, Educational Committee, Warm Air Heating and Air Conditioning Association, outlined the short course in air conditioning to be held at Michigan State College, East Lansing, Michigan, March 27, 28 and 29.

(Continued on page 59)



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AMERICAN ARTISAN

Air Conditioning Section

**Devoted to the technical and merchandising problems
of air conditioning in homes and small buildings**

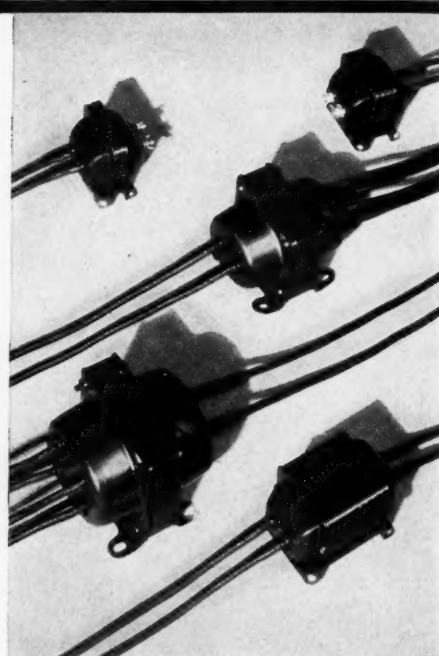
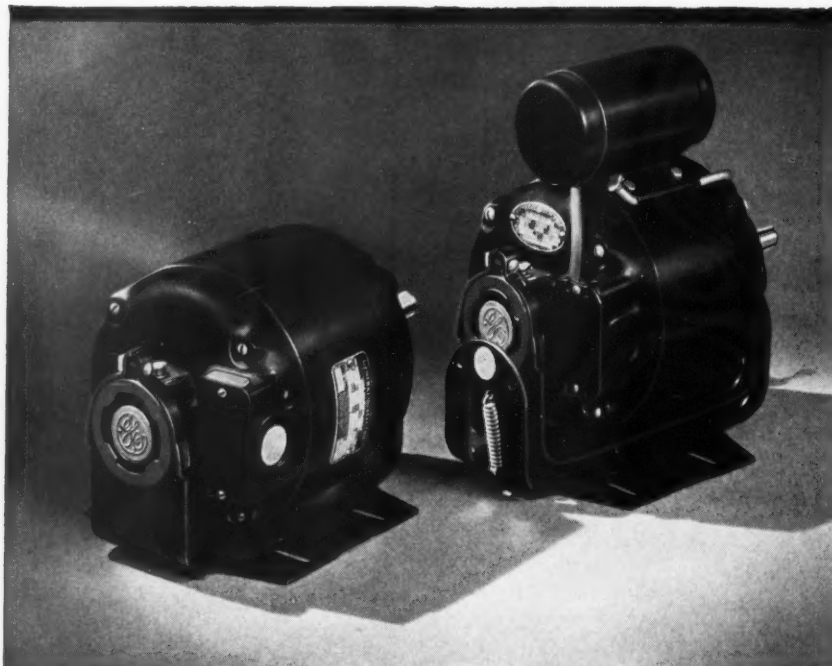
WE sincerely hope that you have been following Mr. Konzo's articles in this section. This is the first time that any member of the Research Residence staff has been permitted to write according to a schedule of articles of interest to the industry.

- - - The articles in the series have been planned to cover a dozen or more practical, every-day problems. The conclusions drawn are based upon facts established by test—we hope just the answers you want and need.

- - - So far the series has covered ducts, dampers and details of duct design. The article in this issue deals with bonnets. Future articles will cover such things as resistance, registers, stratification, cold walls, velocities and temperatures.

- - - If you would like to have information on any particular subject write us at once.

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Air Conditioning Questions and Answers

Condensation

American Artisan:

We have been building in and around Rockford a number of houses and in the building of these houses have used both wooden and steel sash. We have used the steel sash with Thermopane and also with single strength plate glass.

All the houses we have built are humidified houses in which we attempt to maintain the humidity at approximately 40 per cent in the winter time.

From our observations, the steel sash as it is furnished today is not satisfactory for use in humidified houses due to the fact that the steel itself collects condensation and as a result the sill is continually wet. This we find to be true regardless of whether we use Thermopane or single plate glass.

Naturally, when we are using Thermopane we do not have a frosting-up of the glass itself, but we do have the condensation on the sill as well as ice formations on the steel frame.

We have followed your magazine articles quite closely, but have never found a solution in any of them to our particular problem. In the one house which we have built with wooden sash and wooden storm windows we have absolutely no condensation forming on the windows or the sills. It would seem, therefore, that we could obtain the results we desire by putting wooden storm sash on the outside of the steel windows, but in our opinion we do not believe the manufacturers of steel sash would like to see this done. However, as far as we can ascertain they do not have a solution for the situation. The Thermopane, of course, solves the question of ice on the windows, but if it is still necessary to put wooden storm sash on the outside of steel windows having Thermopane there is no reason for actually putting money into Thermopane.

Our observations even with the wooden sash show that the storm window must be on the outside to permit cold air between the glasses rather than humidified warm air. Putting it on the outside, the glass does not frost; while if it is on the inside, the glass does frost.

Can you give us any solution as to the proper way to install steel windows to overcome this forming of condensation on the sills and spoiling

of the wood work? If you know any one you desire to refer us to we should appreciate that, or any information you can give us.

K. A. S., Illinois.

Reply by the Editors:

So far as we know, there have been no tests by the American Society of Heating and Ventilating Engineers or any other interested association for determining just why this moisture occurs on steel frame windows. Last winter our engineers ran some field tests on houses having windows of this type and from these tests we secured some information which leads us to general conclusions. These conclusions might be listed as follows:

Windows having steel frames and steel members transmit heat rapidly through the steel sections and, as a result, these steel sections are always cold on the inside. In houses we have tested these steel sections are so cold that they feel uncomfortable to the touch. The result is that when a blanket of warm air is passing up or down the window carrying moisture, the moisture is condensed out of the air as it strikes the cold steel section. This may and does occur even where the glass does not show condensation.

There does not seem to be any feasible method of keeping these steel sections warm because it is not advisable to heat the air in the room to such a temperature that the steel section will be warm.

We believe the most satisfactory solution will be to install wood framed storm sash on the outside of the steel casement window. This will provide an area of semi-warm air between the storm sash and the steel window and serve to raise the temperature of both the glass and the steel sections. At 40 per cent relative humidity it should be possible to raise the steel section temperature high enough to eliminate condensation.

One or two engineers here in Chicago, who have run up against this same problem, are endeavoring to solve it by applying cork strips or

asbestos insulating compound on the outside of all exposed steel surfaces. This is a rather difficult job because mullions are frequently molded in cross section and rather narrow and it is not the easiest job to apply cork strips to such metal sections. Nothing definite has been determined about the feasibility of this plan.

We recently tested a house having metal windows, where provision had been made by the metal window manufacturer to install storm sash on the inside of the frame. This storm sash is metal with a single glass area so that it does not detract from the appearance of the metal window. We did not have an opportunity to test this installation for condensation and can only judge that it is probably satisfactory from this standpoint.

We rather hesitate to comment on the fact that you find condensation on the sills. We do not know from your letter whether these sills are wood or metal. We take it that they are metal and would be suspicious of the tightness of the window which may permit infiltration of cold air between the lower part of the window and the sill. If there is a thin blanket of infiltration over the sill then, undoubtedly, this may cause some condensation. If this is not the case, then it must be due to the fact that the air is moving down over the glass and losing temperature all the way down. By the time it reaches the cold steel sill it has reached the dew point and is ready to deposit moisture. We suggest that you take some thermometers with large graduations and test the temperature of the air up and down the face of the window.

Duct Work Costs

American Artisan:

I am wondering if you have or know of anything in print on a quick and easy way to figure the material and labor cost of rectangular duct work?

R. M. M., Michigan.

Reply by The Editors

In the January, 1935 issue we published a nomographic chart method for calculating the amount of metal required for fabricating a rectangular or round pipe supply and return system. This is the simplest system (in fact the only system) we have ever seen. Use of the chart requires a complete layout of the duct system—but the duct system should be laid out before any attempt is made to calculate the cost of the metal work. Any calculation made before the duct system is all laid out is only a guess and worth little.

Automatic Controls For Air Conditioning Systems

We skipped our discussion of automatic controls for zone operating systems in January. We said in December that zone control is bound to come and gave the reasons why. In this article we present the three popular variations of zone control and explain the operating characteristics of the three systems. Three wiring diagrams with explanation of operation are presented. The drawings can be used to wire the instruments.

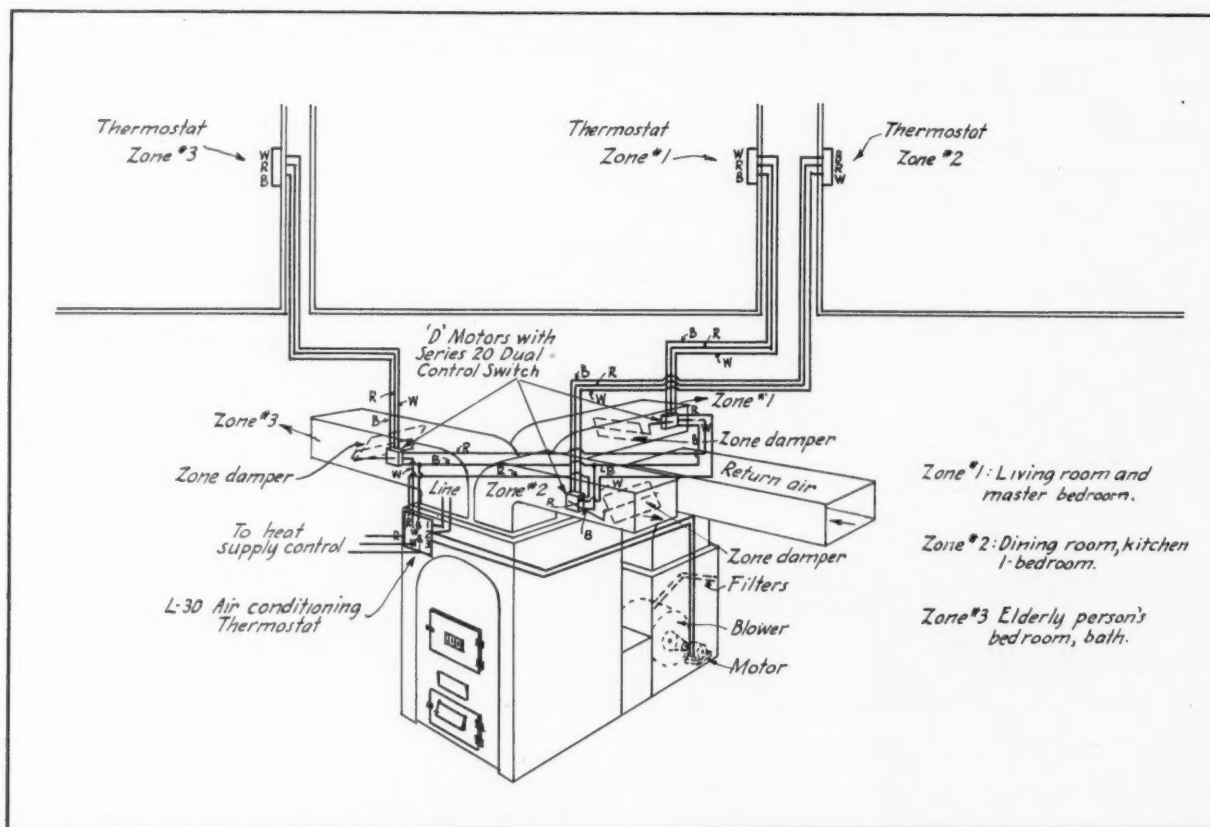
THERE are three variations of zone control being used. Before we study each system in detail let us analyze some of the basic differences.

First—the relief zone installation. By relief zone is meant a system of duct groups wherein one zone will open when all zone thermostats are satisfied if the bonnet temperature gets dangerously high. Usually this is a room or part of the house where heat loss is unusually high or where we need not maintain a close temperature range. Such a zone might be the garage, sun porch or recreation room. Another common relief area is the basement

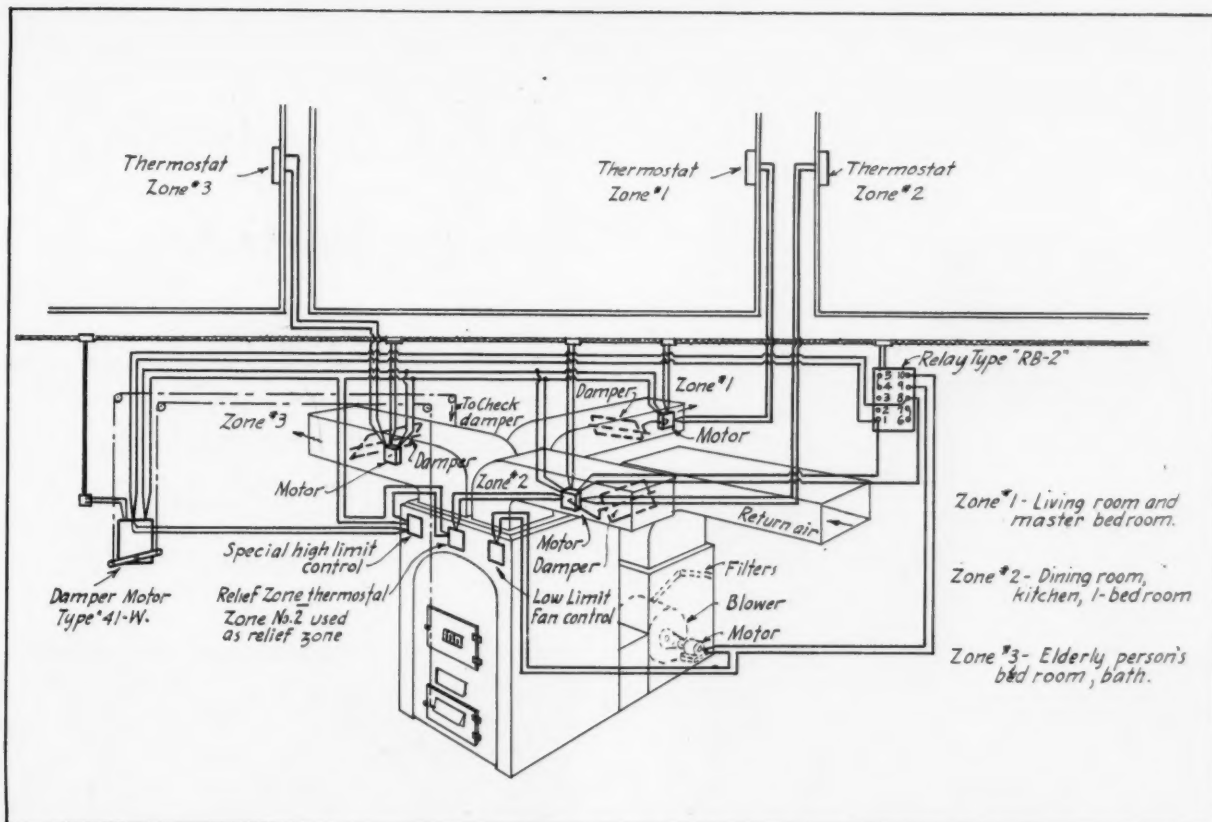
where excess heat may be introduced and where it serves a useful purpose in keeping floors warm, etc. The relief zone is purely a safety measure—it prevents dangerous over-heating of the furnace and permits the escape of excessive temperatures without over-running house thermostats. The relief zone seldom operates on oil or gas fired jobs, but may be called into use on hand fired coal or stoker fired furnaces.

For an example, let us assume we have selected the garage for our relief zone. Our fire has been accelerating for some time and all zones are finally

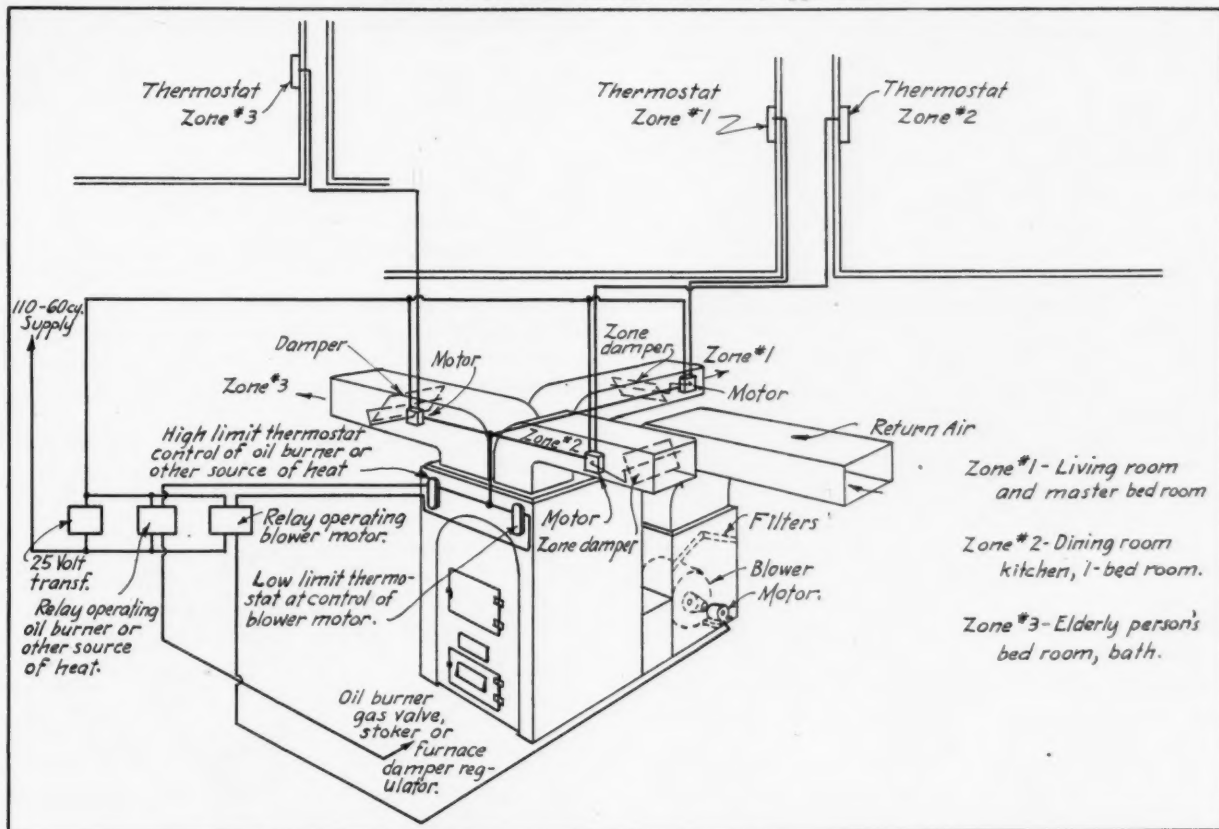
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When the zone thermostat calls for heat the damper to that zone is opened, the built-in switch in the motor causes the furnace draft to open and the check to close and closes the circuit to the fan. The fan will operate if bonnet air temperatures are above the setting for the fan control. If the bonnet air temperature gets too high the high limit control in the air conditioning furnacestat closes the draft and opens the check, even though some zone is still calling for heat. Control of the fire is returned to the zone thermostats when the bonnet temperature falls to a safe point. No provision is made in this hook-up for opening a relief damper to a relief zone. Minneapolis-Honeywell apparatus.



In this system when any zone thermostat calls for heat, it operates the zone damper motor for that zone, opening that damper. At the same time the fan switch of that damper motor closes the thermostat control circuit of the draft damper motor, causing it to open the draft and closing the check. When this draft damper motor goes to the open position, its fan switch closes the circuit and turns on the blower. A two-circuit high limit control is connected in series in the control circuit of the damper motor. If bonnet temperature becomes excessive the fire will be checked, regardless of the demands of any room thermostat. This high limit control makes a second circuit whenever it breaks the control circuit which turns on the blower. No. 2 zone is a relief zone controlled by a relief zone thermostat. When all zone thermostats are satisfied, but if bonnet temperature is too high, this relief zone thermostat will open the No. 2 zone damper; the blower will be turned on at the same time, while the draft cannot open because its control circuit is broken. H. M. Sheer Co., apparatus.



In the above wiring diagram, when any thermostat calls for heat, the damper in the duct supplying that zone is opened and this, through a relay, causes the burner to start or the draft door to open if coal fired. Providing that the high limit thermostat does not prevent it, the burner will run as long as any zone is calling for heat, and will shut off only when all the zones are satisfied. The high limit thermostat will shut down the heat supply when the high limit of furnace temperature is reached. The low limit thermostat will allow the fan to run only when the furnace is warmer than the predetermined low limit of say 150°. No control for a relief zone is shown, however, it would be very simple to provide such a control simply by adding a circuit which would open a damper when the high limit thermostat had shut off the burner, and all of the zone duct dampers had closed. Barber-Coleman apparatus.

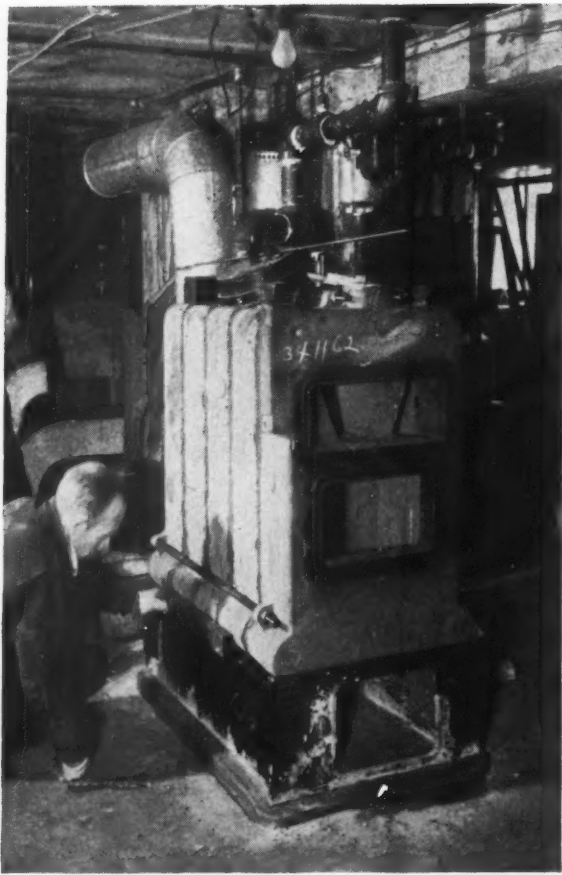


Fig. 1—Leveling up the boiler. Note the traps, valves, pressure regulator and piping system.

IN this article we will discuss the heat production arrangement and some of its problems. Fig. 4 is a perspective view of the boiler, coils, piping, traps and valves of the heating system in the AMERICAN ARTISAN Test House. The plant is that commonly known as a vapor system. As many of our readers may not be familiar with this type of steam system it will be discussed here briefly.

A vapor heating system has separate return and supply pipes, which operate under pressure at or near atmospheric pressure. The condensation is returned to the boiler by gravity. This system is said to have an advantage over the one pipe or pressure steam system due to the fact that heat or steam is supplied to the radiators or coils after the pressure has dropped below 0 pounds. Such a system has thermostatic traps or other means of resistance on the return ends of the heating units. Such systems are generally open to the atmosphere at the receiver or regulator in the basement, but in other respects is closed to the atmosphere. The radiators or heating coils do not have air relief valves.

A float valve ("A") or vent is placed on the end of the dry return line and this valve allows the air to be vented from the system into the basement while the water is returned to the boiler. The air is driven out of the system when the coils fill with steam. When the steam output of the boiler decreases the condensation in the coils causes a vacuum to form in the system and the boiler continues to generate steam as water boils at a lower temperature than 212 degrees at pressures under atmospheric or approximately 14 pounds per square

Air Conditioning For Radiator Heated Houses

Boiler and Coil Problems Checked in Our Test House

By Platte Overton

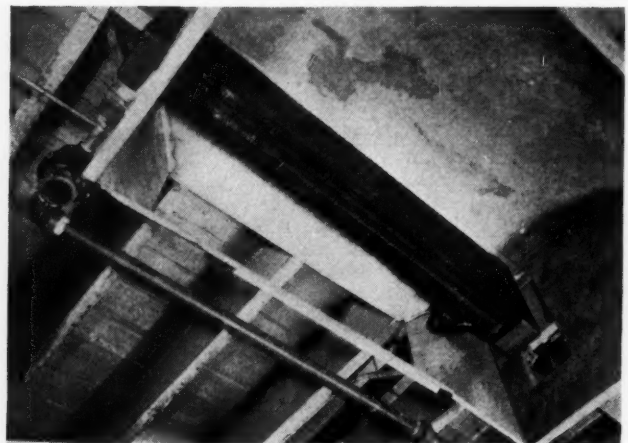


Fig. 2—The first installation had a single coil. A picture looking up from the floor at the coil within the plenum chamber.

inch. It is a well known fact that water will boil on Pike's Peak at around 180 degrees F.

The usual function of a trap is to allow the condensate or water to pass into the return lines and to prevent the passage of steam. Some traps are required to allow the passage of air and condensate. Others may be designed to allow the passage of air and to prevent the passage of steam or condensate or both.

Traps are used for returning condensate either

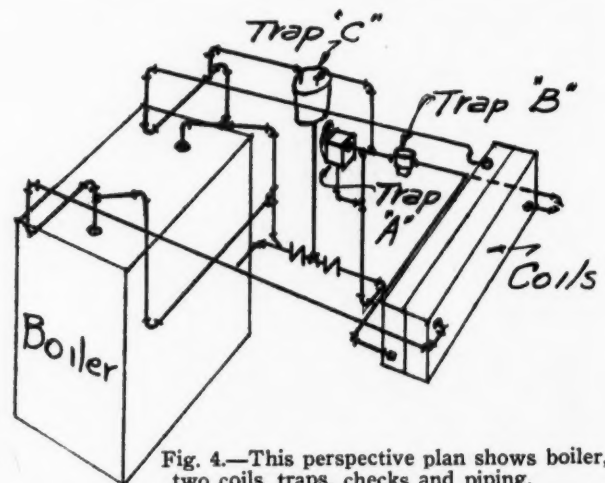
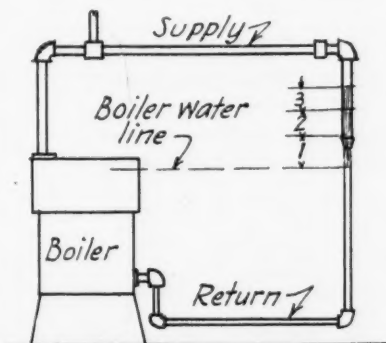


Fig. 4.—This perspective plan shows boiler, two coils, traps, checks and piping.

by gravity or by steam pressure, or both, to the boiler.

In practically all traps it is necessary that the pressure within the trap at the time of this discharge be equal to or above the pressure against which the trap must work or discharge. The trap must work against the friction, velocity and static head on the discharge side. This resistance is shown in Fig. 5. Such pressures are, of course,

Fig. 5—The resistance against which the trap must work is shown graphically in this sketch. No. 1 is static resistance; No. 2 is static head on valve; No. 3 is static head needed to induce return water flow.



very much like those encountered in duct work with air under pressure or gravity.

No. 1 is static head or pressure necessary to overcome loss in pressure of the piping system. No. 2 is static head required to open the clapper in the check valve. No. 3 is static head needed to make the water flow back to the boiler. The line between No. 2 and No. 3 is the head at which water is in balance and more head gives force to the water returning to the boiler. It is very important in a vapor system that the sum of the heights of 1, 2 and 3 be not less than 18 inches.

When the return main can be kept sufficiently high above the boiler water line the condensate will return by gravity. In actual practice this is generally impossible. Therefore, a boiler return trap ("C") is installed to handle the condensate. The trap or receiver may not work for long periods. In fact, it is only called into use when some condition exists where the pressure differential exceeds the static head (Fig. 3) provided.

This trap is installed to assure safety for such systems, and correct operation under varying conditions. In the AMERICAN ARTISAN Test House this trap does not function unless the boiler pressure is above $1\frac{1}{2}$ pounds or in early morning firing-up periods. With $1\frac{1}{2}$ pounds of steam pressure or over this trap works in about 3 minute cycles.

When the condensate will not flow into the boiler under pressure, it will feed into this trap

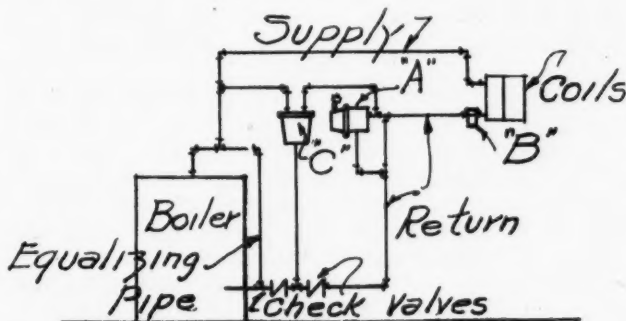


Fig. 3—It is advisable to install a boiler return trap where the return line is not very far above the boiler water line. Here is the Test House Trap (C); also other checks and traps.

where it tilts a float that automatically actuates a steam valve from the boiler. This valve admits steam to the trap at boiler pressure. The equalizing of the pressure allows the condensate to flow back to the boiler. The top of this trap should be 1 inch below the bottom of the dry return.

Various traps and systems of traps are of a proprietary nature. There are many types of systems and makes and they are all good. However, they should be carefully installed. The reader may be interested in some of the "bugs" that developed as the installation progressed.

Coil Characteristics

The major error occurred in obtaining a coil too small for the requirements. In choosing the coil these requirements were roughly based on 2,000 c.f.m. and a 70 degree temperature rise, or 2,000 c.f.m. from 70 to 140 degrees.

At 500 foot face velocity this would require a

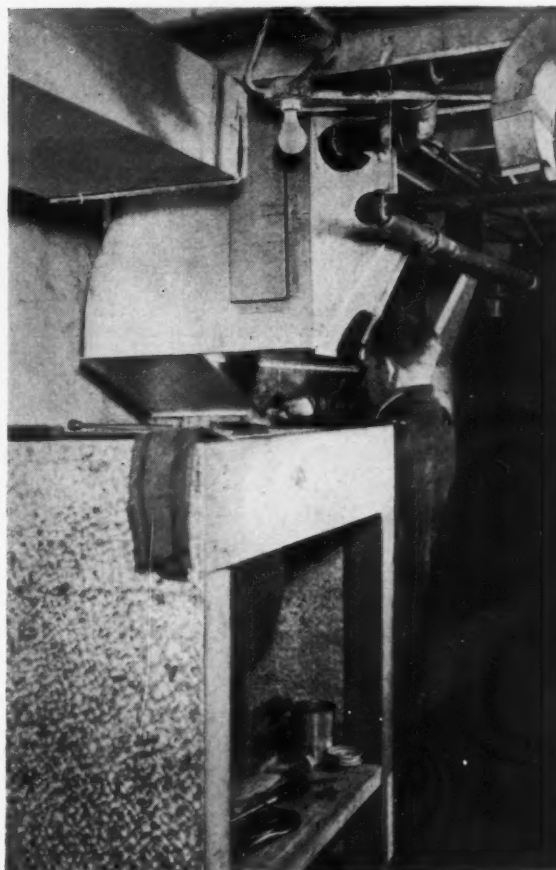


Fig. 6—The heart of the Test House conditioning system is this assembled conditioner containing blower, motor, coils, filters.

coil—2,000 divided by 500 equals 4 square feet. 500 feet per minute is standard practice for coils used in residential fan systems.

On the manufacturers' tables it was observed that a 2-row coil would give a final temperature of 141 degrees with an entering or initial air temperature of 70 degrees, 5 pounds steam pressure and a 500-foot face velocity. The designer (the writer) knew, of course, that the normal pressure of the boiler would be from 3 inches of vacuum to 1 pound of pressure, and in an attempt to use as small a

(Continued on page 39)

Forced Air Heating Facts From The Research Residence

By S. Konzo

This article, which is the third of the series, and succeeding articles on the forced-air heating research carried on at the Warm Air Research Residence in Urbana, Illinois, are based to a large extent on the material published in Bulletin 266 of the Engineering Experiment Station of the University of Illinois. The author has also drawn on additional sources for these discussions.

Introduction

The furnace casing and furnace bonnet should be considered as integral parts of the furnace itself. A furnace without a jacket or casing is nothing more or less than a plain heating stove, and its application is limited to the room in which the furnace is located. By encasing the furnace and tapping the casing with air ducts at suitable points, that simple stove is made to function as a heating unit capable of distributing heat to other rooms in addition to the one in which the furnace is located.

By enclosing the furnace with a suitable jacket we have, therefore, converted a room type heating stove to a central heating unit. In other words "clothes make the furnace" as well as the man. If by this rather simple procedure the entire functioning of the furnace can be altered, it is not unreasonable to expect that the manner in which the encasing is done should also be of some importance. In this article the author proposes to discuss furnace casings, and particularly furnace bonnets, from the standpoint of their relation

to the temperature equalization in the bonnet and their relation to the heating performance of the furnace.

A. Bonnet Temperatures in Gravity Systems

For purposes of comparison, the results obtained with gravity furnace installations will be considered first. One of the main difficulties encountered by any installer of a gravity warm air furnace installation is the lack of uniformity in the air temperature at various parts of the bonnet from which the leaders are taken.

As an example of this statement a temperature diagram is shown in Fig. 1 which gives the bonnet temperatures obtained during one of the earlier tests in the Research Residence. The innermost circle represents the furnace bonnet, and the radial lines extending outwards, like the spokes in a wheel, represent the direction of the leader take-offs from the bonnet. The concentric circles indicate the air temperatures at the bonnet. If the bonnet temperatures indicated by the solid line in Fig. 1 are tabulated, the following table is obtained:

TABLE I

Example of Bonnet Air Temperatures in a Gravity Installation

Room	Bonnet Temp. at Leader Take-Off
Living Room	131 deg. F.
East Bedroom	137.5
East Dormitory	130
Living Room	120
Hall	111
Dining Room	119
West Dormitory	120
Bath Room	122.5
Southwest Bedroom	122.5
Northwest Bedroom	120
Kitchen	117

Average is Approximately..... 123 deg. F.

Note that the deviation in bonnet air temperatures is from a minimum value of 111 deg. F. to a maximum of 137.5 deg. F. with a mean value of approximately 123 deg. F. For colder weather than that which prevailed when the data for Fig. 1 were obtained, the average bonnet temperature would be higher, and the deviation in bonnet air temperature at any point from the average value would also be greater. In fact, temperature deviations as much as 20 deg. F. to 30 deg. F. from the average value are not uncommon in the ordinary gravity installation.

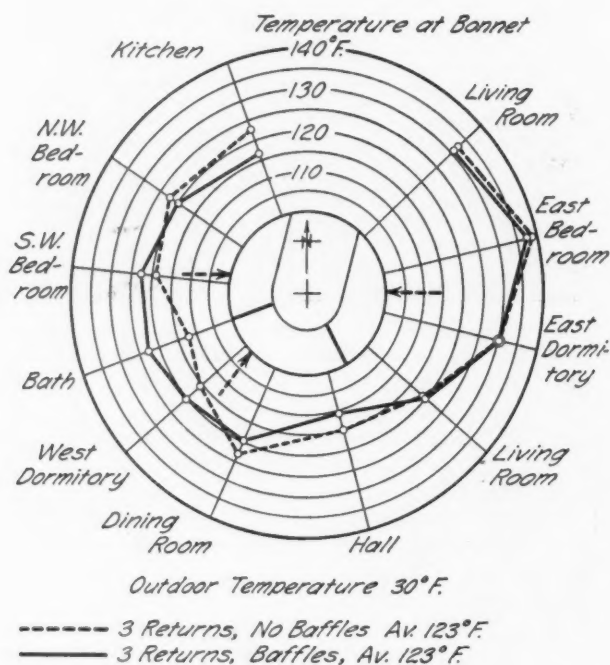


Fig. 1.—Diagram showing variable bonnet temperature in a gravity installation.

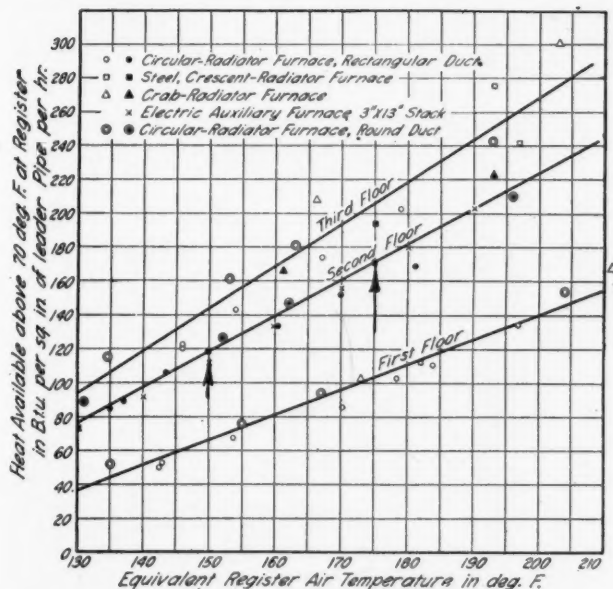


Fig. 2—Heat carrying capacity per square inch of leader pipe area for gravity installations.

B. Significance of Bonnet Temperatures in Gravity Systems

Briefly stated, a low bonnet air temperature will mean a correspondingly low register air temperature for the room. Since a low register air temperature is accompanied by a low "stack effect" or "chimney effect," the heat carrying capacity of the leader and stack will be below normal. Thus rooms served by such leaders and stacks may be underheated.

This fact is presented graphically in Fig. 2, and in tabular form in Table II. *It should be recognized that these values are only for gravity installations and do not apply to forced-air installations.*

TABLE II

Heat Carrying Capacity of Leaders for Various Register Air Temperatures in a Gravity Installation.

Register Air Temperature in Deg. F.	Heat Available in B.t.u. per sq. in. of Leader Pipe First Story	Heat Available in B.t.u. per sq. in. of Leader Pipe Second Story	Heat Available in B.t.u. per sq. in. of Leader Pipe Third Story
130	38	77	95
140	51	97	119
150	67	120	145
160	81	140	170
170	96	160	195
175	105	170	208

Notes: Data from Fig. 2. Values for register air temperature of 175 deg. F. are usually assumed for design values in gravity installations.

Suppose that the leader pipe for a second story room was selected on the basis of 175 deg. F. register air temperature. Then from Fig. 2 it may be noted that for each square inch of leader pipe the heat available at the register will be approximately 170 B.t.u. per hour. However, suppose that in the actual installation, the register air temperature was only 150 deg. F. (due to the low bonnet air temperature at the leader take-off) instead of 175 deg. F. as was estimated. In this case the heat available at the register for heating the room will be approximately 120 B.t.u. per hour or only 71% of the estimated value. The room would probably be underheated through no fault of the installer, except that he had failed to foresee the possibility of the bonnet temperature being sub-normal for that particular run.

C. Factors Affecting Bonnet Temperature Variations

This variation in bonnet air temperature at various points on the bonnet would not be of such concern if it were possible to predict beforehand the nature and magnitude of the temperature variation. *So far there is known no fixed relation between the occurrence of a high temperature (or low temperature) point on a bonnet and any detail of furnace or casing construction.*

However, in an earlier study on gravity furnaces the following general conclusions were drawn:

1. "A single return resulted in increasing the eccentricity of the temperature diagram (similar to Fig. 1) with adverse effect on the temperatures near the furnace front, whereas the triple return produced a more nearly concentric diagram with favorable effect on the forward pipes."

2. "It is concluded, therefore, that a divided system of returns produces a more nearly uniform air temperature distribution in the furnace bonnet than a single return."

In addition it has been frequently observed that the portion of the bonnet directly over the firing door of the furnace is at a lower temperature than the rest of the bonnet.

Later studies made with "booster" fans located in the cold air shoe and also in the furnace bonnet indicated that "the irregularities in the temperature of the air entering the different warm air pipes could not be entirely corrected" when the fans were used in conjunction with the conventional low type of bonnet found in gravity installations. The bonnet location for the fan was, however, found to be more advantageous in this respect than the fan location in the cold-air return.

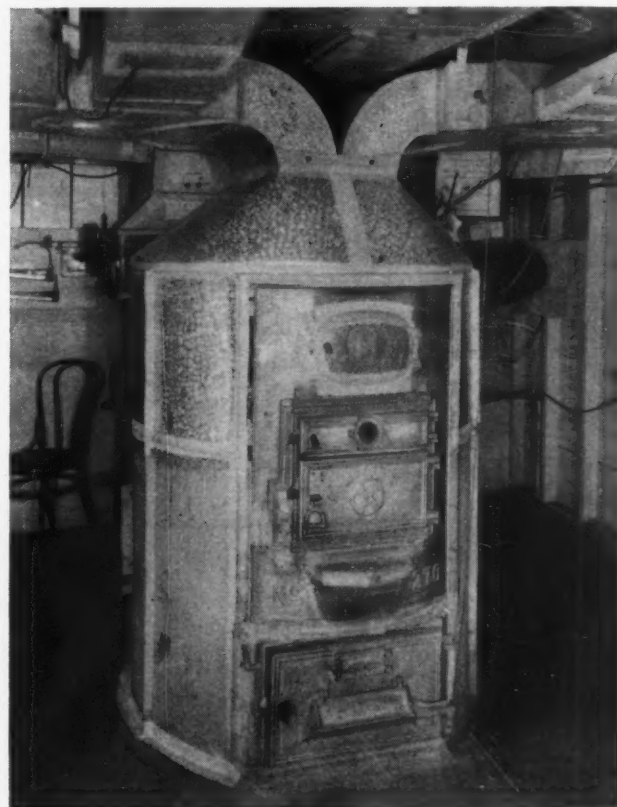
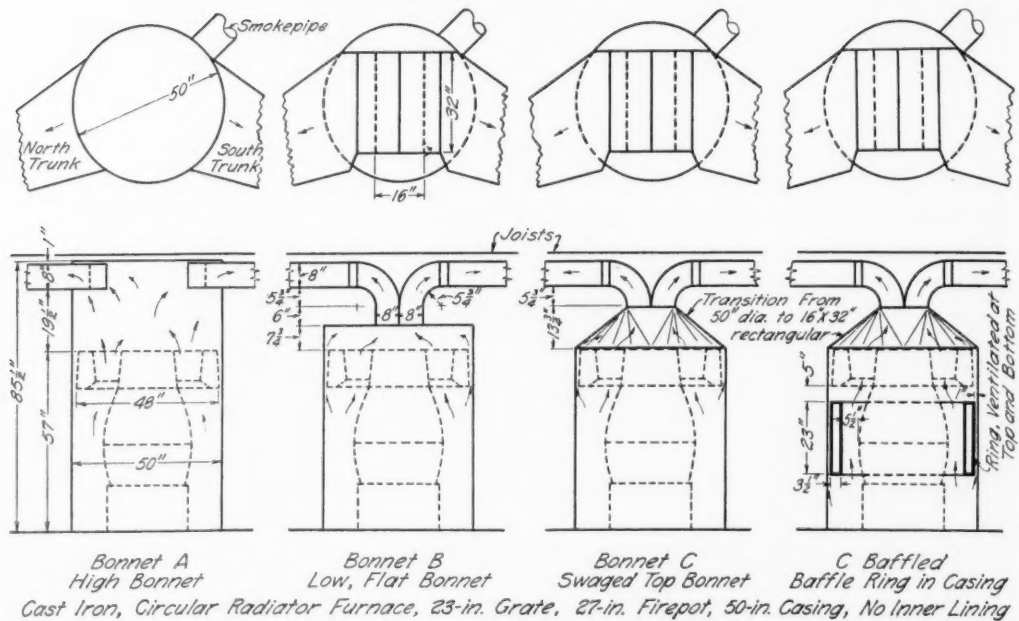


Fig. 5—This bonnet (type C) was found to be equal in merit to the high bonnet (type A) in the research Residence forced air system.

Fig. 4—Types of furnace bonnets and baffling tested in the Research Residence forced air installation. Types A and C and C-Baffled proved most effective.



Also, "the maximum deviation from the mean temperature of the air entering all of the warm-air pipes is less at low than it is at high register air temperatures. The use of a fan may, therefore, result in some improvement in the air temperature distribution insofar as it may lower the average operating register air temperature as compared to that required for gravity operation."

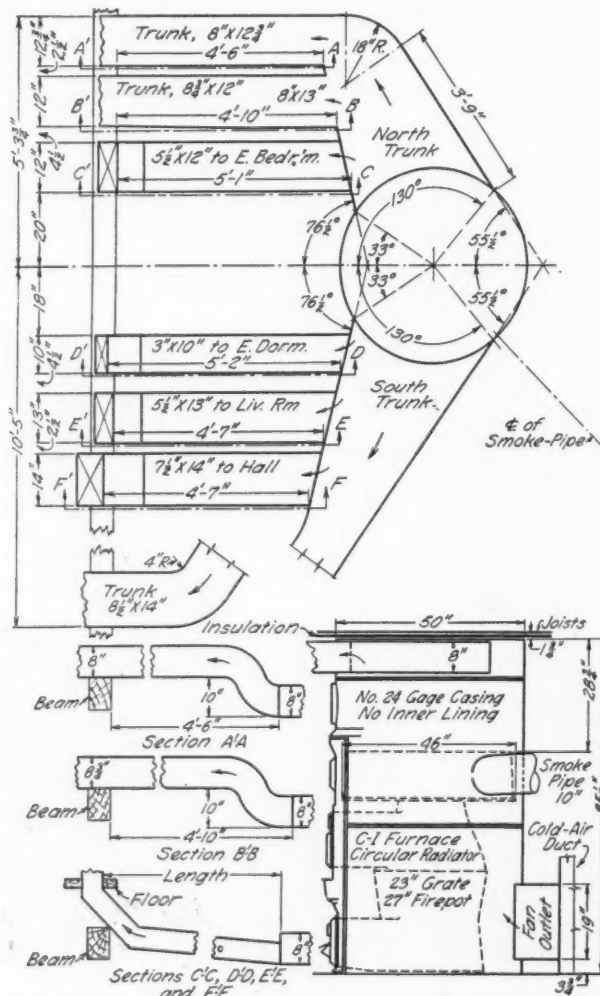


Fig. 3—Details of high bonnet construction (bonnet A) in Research Residence forced air installation.

D. Bonnet Temperature Variation with Forced-Air System

Temperature variations in the bonnet are as annoying and as serious in forced-air installation as in gravity systems. In the initial forced-air system in the Research Residence especial attention was paid to this point and after due deliberation a high bonnet construction was decided upon, as shown in Fig. 3. Note that a large plenum chamber, $28\frac{3}{4}$ inches in depth and 50 inches in diameter, is formed over the furnace. In addition, the trunk outlets were made large and wide. The results obtained, from the standpoint of temperature equalization, were excellent, since the temperatures at the north trunk were within $1\frac{1}{2}$ deg. F. of the temperatures at the south trunk under ordinary operating conditions.

The conditions that seem to favor the equalization of air temperature in a bonnet are as follows:

1. Using a large plenum chamber over the furnace.
2. Increasing the air motion by handling larger air quantities.
3. Lowering the operating temperatures in the bonnet by handling larger air quantities.
4. Using large and wide take-offs that cover a considerable portion of the bonnet.
5. Properly baffling the furnace so as to force the air over the hot castings.
6. Using wide boot connections to the casing.

E. Three Types of Tested Bonnets.

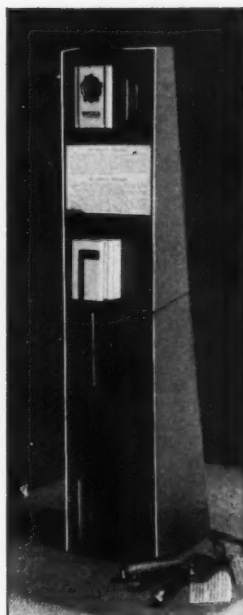
The details of the three types of bonnets which were tested in the Residence, with the circular-radiator type furnace, are shown in Fig. 4 and are designated as bonnets A, B, and C.

Bonnet A was a cylindrical bonnet with straight vertical sides and a flat top. It was carried up to within 2 inches of the bottoms of the joists and formed a plenum chamber $28\frac{3}{4}$ inches high above the top surface of the radiator. The two main air trunks departed horizontally from the sides of this chamber and near the top.

Bonnet B was also a straight side, flat top bonnet, but in this case the top was only $7\frac{3}{4}$ inches from the upper surface of the radiator. The two main air trunks

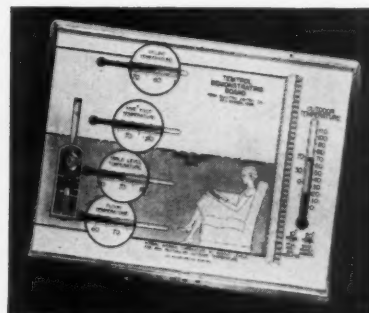
(Continued on page 41)

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The Relationship of Humidity to Health

By M. W. Pehl

Instructor, Air Conditioning Engineering, Kansas
City Junior College, Kansas City, Mo.

JUST what part does humidity, or the lack of proper humidity, play in the relation to the health of the general public? The human body can exist under a fairly wide range of dry bulb temperature difference without any serious bodily injury. Admiral Byrd at the South Pole spent three months in a temperature far below zero day after day with no permanent ill effects. In the tropical regions thousands of people live year in and year out in a temperature for the most part well over 100 degrees F. But if we had to live in an atmosphere that is deficient in moisture or in an atmosphere that has too much moisture I believe we would soon show the effect of these unbalanced conditions.

The amount of moisture that is required for the average apartment or home is not a difficult matter to determine, and the equipment to provide this needed moisture can be installed in any home or apartment. The difficult thing is to provide some automatic means which will warn us when the humidity in the room drops below the normal range. If we could have a tell tale bell that would ring, or a light bulb that would light up to let us know that more moisture is needed in the air, we could keep our homes in a more healthful condition.

A Specific Problem

Last winter one of my students in a class in air conditioning became so interested in this subject that he built a blower of plywood rotor sides and strips of old venetian blinds for the fan blades, thus with a small $\frac{1}{4}$ horse power motor he converted a forced air system out of a gravity warm air furnace system that would be a credit to any metal worker. Filters

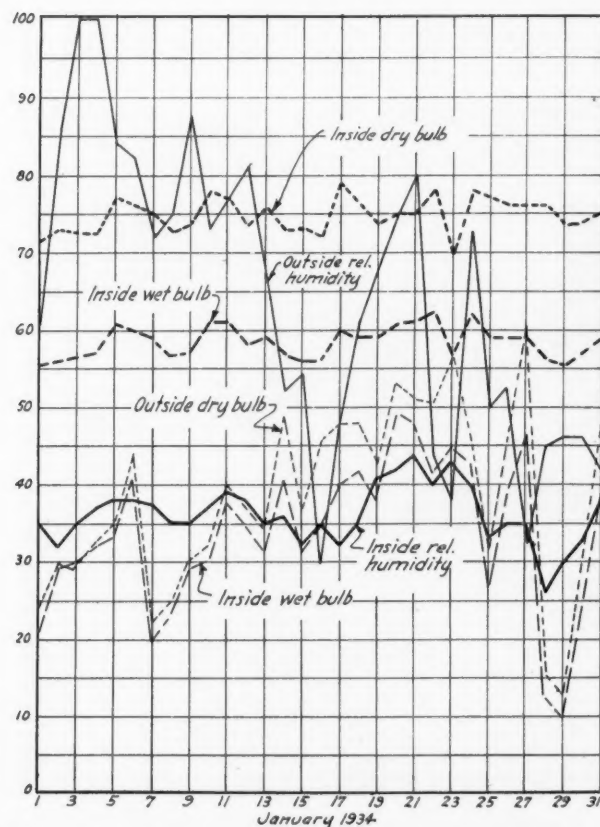


Fig. 1—On this chart the author has plotted curves for inside dry bulb, outside dry bulb, outside relative humidity, inside relative humidity for a full winter month. Note how the curves tend to follow one another.

were installed in the return air chamber, and in the bonnet of the furnace a water pan with approximately 450 square inches of evaporating surface was installed in addition to the regular water pan under the feed door.

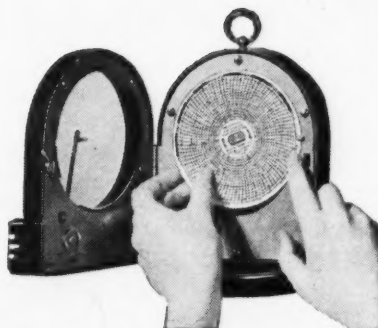
The accompanying charts show the outside and inside relative humidity, the outside and inside dry bulb temperatures, the outside and inside wet bulb temperatures, outside grains of moisture, inside grains of moisture and added grains of moisture per cubic foot of air. This graph shows very clearly how much moisture was needed and evaporated from the water pans. Readings were taken at approximately 7 P. M. each evening at the same location indoors, and the outside readings were taken from the U. S. Weather Bureau reports for the same hour. From chart (1) we see that the inside relative humidity remained fairly constant between 32 and 43 per cent, but as a general trend it followed the outside dry bulb temperature, but did not conform at all with the outside relative humidity.

Charting Humidity Requirements

Chart (2) shows the absolute humidity or grains of moisture per cubic foot of air both for inside and outside conditions. From these curves we can see that the amount of moisture in the outside air varies almost exactly as the temperature. If we follow the curve of moisture added we find that its shape is almost the exact reverse of the outside grains of moisture line. This shows quite clearly that this type of humidification is almost automatic in its regulation of the necessary additional moisture required.

It is interesting to note the calculations on the
(Continued on page 44)

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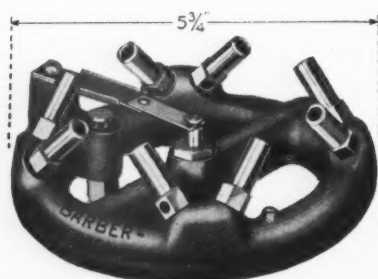
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BARBER BURNERS for Special Purposes

THE Barber Gas Burner Co., Gas Burner Specialists, now announce a new line of burners for commercial purposes. A few of the typical appliances to which these burners are applicable are listed below. There are many others. If your product is not mentioned here, we will nevertheless welcome your inquiry.

Each of these new Barber units (of which there are six models in several sizes) is specifically designed for its own purpose. A feature of utmost importance is that each unit is equipped with fully automatic built-in Safety Pilot Control.

The sheet metal industry plays a part in the production of many of the devices listed here. Promote your own business through the use of these reliable, approved gas burners in your product. Write for Illustrated Bulletin with Prices (No. 1234A).



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No. M.P.-12
Barber Burner

THE BARBER GAS BURNER COMPANY
3704 Superior Ave. • Cleveland, Ohio

BARBER

• Automatic Jet Gas •

BURNERS

Automatic Controls

(Continued from page 26)

satisfied and all zone dampers close. Excessive temperature builds up in the bonnet so the relief zone damper opens, the fan starts and the heat not needed in the house is blown into the garage.

Opposed to the relief zone system is the installation where we have *no* relief zone. Each section of the house has its own zone of ducts and its own thermostat and each duct group closes when the thermostat is satisfied. We can see that there may be some danger in such a system on a sketchily-fired coal furnace.

Two other basic differences occur in the method of fire control. One system maintains a level of temperature in the bonnet. Draft may open even though all zone thermostats are satisfied, but heat is always available immediately. The opposed system controls the fire by the zone thermostats and the draft will open only when some zone thermostat calls for heat.

In all zone control systems now popular the control of the fan is a function of the zone thermostat. The only time when the fan is started without guidance of the zone thermostat is when the relief zone opens. The only time the fan is stopped without guidance of the zone thermostats is when bonnet air temperatures get too low for comfort.

We can readily see, then, that these differences in basic control plans group themselves to give us three generally accepted control systems. We have, therefore, the following systems with these characteristics:

System Number 1

1. We have *no* relief zone. When all zone thermostats are satisfied all zones are closed at the furnace.

2. We control our fire by the zone thermostats so that the draft will open and the fire accelerate whenever one or more zones call for heat and our fire will be shut down when all zone thermostats are satisfied.

3. Our fan will start whenever any zone thermostat calls for heat if bonnet temperatures are high enough and stop when all zones are brought up to temperature.

4. We plan to control our fire within narrow limits so that we will not have excess heat when all zones are up to temperature and at the same time we must produce heat quickly so that we can get heat into the rooms immediately when needed.

5. We will employ a low limit control on our fan so that the fan cannot run when the bonnet temperature is so low that the register air feels chilly.

6. We will use a "high limit" fire control which will close the draft before the fire runs away, even though the thermostats are still calling for heat and return the fire to the control of the thermostats whenever the bonnet air temperature drops to safe temperatures while the thermostats are still calling for heat. (See reference to stack limit controls.)

System Number 2

1. We use a relief zone. When all zones are satisfied and if our bonnet becomes dangerously high the safety control opens this zone, permitting the heat to pass into the relief area. Such an area

may be a garage, recreation room, basement or sun porch or some room not requiring close temperature control.

2. We control our fire by the zone thermostats so that the draft opens and the fire accelerates whenever any zone requires heat and the draft closes when all zone thermostats are satisfied.

3. Our fan starts and stops on command of the zone thermostats, providing there is heat in the bonnet. The fan stops whenever all thermostats are satisfied and cannot run unless the relief zone opens.

4. As we control our fire from the zone thermostats we must restrict the fire within narrow ranges so that we will generate only enough heat to satisfy the needs of the house and will have just as little extra heat as possible after all thermostats are satisfied.

5. We place a low limit control in our fan circuit so that the fan will not run if the bonnet air is too cold.

6. We employ a "high limit" fire control which closes the draft door at a dangerous temperature, even though the zone thermostats are still calling for heat and returns the draft to thermostat control when bonnet temperatures fall to the fire accelerating zone.

7. We must have an additional control (which makes this system different from number 1) which will start the fan and open the damper in the relief zone should bonnet temperatures rise too high when all zone thermostats are satisfied.

System Number 3

1. We have a relief zone through which excess heat is dissipated whenever all zone thermostats are satisfied.

2. We control our fire from a bonnet instrument which maintains a level of temperature in the bonnet at all times whether the room thermostats are satisfied or not. We must choose the temperature zone for this instrument carefully for we want to have enough heat yet not too much heat.

3. Our fan is controlled from the zone thermostats. Whenever any thermostat calls for heat the fan starts immediately because we are keeping the bonnet air temperature up to the fan operating temperature at all times.

4. Our fire control instrument must be readily adjustable so that the owner can raise the temperature zone as the weather gets colder and lower the temperature zone in mild weather.

5. We do not need a low limit fan control for we always have bonnet temperature (except possibly if the fire goes out).

6. We do not need any auxiliary fire control, for our regular fire control keeps the fire within our prescribed temperature ranges.

7. We need a high safety fan control so that if bonnet temperatures rise to a dangerous temperature for some reason this safety will open the relief zone and start the fan.

In reading these specifications of the three common types of control systems for zone operation the reader may raise the question—"Under control system number 3 aren't we likely to generate more heat than we need, especially in mild weather; and do we get too much air and too high register velocities when the full fan volume is thrown into one zone?"

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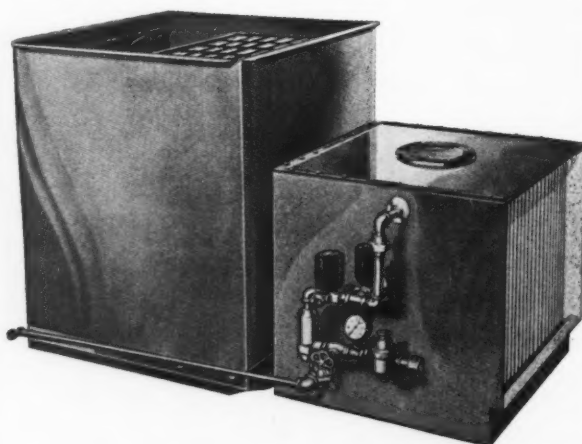
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The answer lies in an interesting fact found to exist in practically all zone systems regardless of size. That fact is that in severe and moderately severe weather some zone is pretty nearly always calling for heat. The result with system number 3 is that while we do maintain a level of temperature, the fact that some zone always needs heat results in our using all the heat we generate just about as rapidly as we produce it.

Increased Sensitivity

This brings up an interesting fact—one of the really valuable features of zone control and zone distribution. Whereas with one thermostat our system functions only as this one thermostat is effected by temperature change within the house, with zone operation we respond to several thermostats which magnifies the sensitivity of our control system several times over. Under zone control our thermostats are individually responding to sun heat, shade, wind pressure, open door and window drafts, and so on.

Perhaps mention should be made in passing of register air temperature. Usually zone control is used in large houses. In many instances one or more zones may be some distance from the furnace. There will be a considerable air temperature drop in these remote runs. With zone control we can compensate for this in two ways—first, raise the general register air temperature so that we will have a good temperature in these remote rooms or, second, size the piping system for remote zones for more air at a lower temperature. Which we do will depend on the job but what we do need not effect the other parts of the building.

Full Fan Volume on One Zone

This brings up the frequently asked question—"In a zone control job what happens when several runs shut off and a large fan suddenly begins throwing its full volume into one zone? Do you actually get the full fan volume through the one zone?"

The answer to this is no. Most fans have what is known as a "limit load." In a zone job such a fan will have increased resistance placed upon it as each zone shuts down until the limit load is reached and beyond this point the fan does not deliver any more air no matter how restricted becomes the path the air follows. This means that on a seven zone job with a properly sized fan, the fan will blow more air through six ducts when one closes but will not blow six times as much air through one zone when all other six zones are shut off. Tests show that the resistance increases by hundreds of percent which in turn places a rapidly increasing load on the fan, whereas air volume increases by one or two per cent at a time so the volume never gets very large. (See report of speeded-up fan delivery on American Artisan Test House Number 1 in the November issue, 1934.)

With these comments on the common types of zone control systems in mind we will proceed to analyze the problems of each of the four plans and try to bring out the particular problems and suggested solutions. (See the March issue.)

Radiator Heated Houses

(Continued from page 29)

coil as possible, planned on maintaining 5 pounds of pressure on such days as the maximum load was required. It was assumed that this maximum requirement would occur not more than 10 days during the heating season.

As the basement ceiling was low it was necessary to obtain a coil not over 12 inches in height to keep the return main 18 inches above the boiler water line. This required a coil 48 inches long to give the required 4 square feet of face area.

Coil Troubles

The supply and return tapping were in the face of the coil header. This is not an ideal condition as top and bottom connections are better. It was impossible to pitch the coil down from the supply to the return end to any great extent. (Fig. 7.)

At approximately 120 pounds of condensate per hour, the steam main from the boiler header was



Fig. 7—Looking into the face of the coil showing supply (top, left) and outlet (lower, right). The supply pipe is $2\frac{1}{2}$ -inch for a coil tapping of $1\frac{1}{2}$ -inch (one source of trouble.)

sized at $2\frac{1}{2}$ inches. Imagine the consternation when the crating was removed from the coil and it was found to have $1\frac{1}{2}$ -inch supply tapplings to which a $2\frac{1}{2}$ -inch steam main must be connected. As it was necessary to provide heat at once, the coil was installed and the following trouble anticipated. The results were obvious.

The manufacturer of the coil who was not thoroughly acquainted with the circumstances surrounding the type of system we were installing,

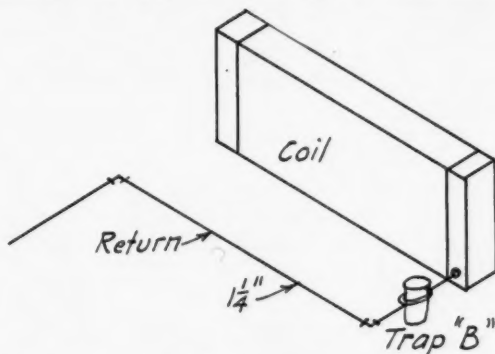


Fig. 8—The first, single coil had the coil trap as shown here. The return end of the coil ran cold (another source of trouble.)

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Low Voltage - Magnetic Type

Accurate to 1° F., Differential 2° F. Indicated adjustable range 55° to 85° F. Electric rating is 25 volts, 75 watts.

12-A2—2-wire with thermometer.

12-A3—3-wire with thermometer.

12-B2—2-wire no thermometer.

12-B3—3-wire no thermometer.



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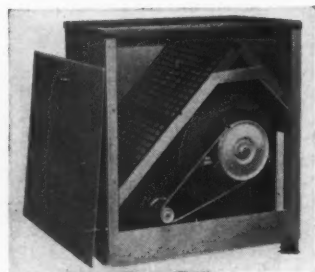
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shipped a coil that had been designed and manufactured for 200 pounds boiler pressure.

The previous rough calculations were inadequate. The final temperature did not exceed 128 degrees. One end of the coil (the return) was cold; final temperature was 98 degrees. Due to the 3 small stacks to the second floor it was found that register temperatures of 160 degrees were necessary to heat this area in zero weather.

There was no control of the boiler as it made steam faster than the coil could condense it and the safety valve was opened frequently. The heating results were a decided flop.

Second Coil

It was decided that another coil should be installed face to face with the present one, thus providing a 4-row unit. The manufacturer shipped a duplicate unit and the final temperature problem was solved. Final temperatures of 192 degrees were obtained at 1-pound boiler pressure.

The second coil was installed with the supply and return tappings reversed to the first coil or a hot end to a cold end. The result was even final temperatures over the entire area of the coil face.

The coil trap ("B") was moved to the position shown in Fig. 9. The new coil was installed during a cold wave and the change was made in a few hours. An extra trap was not at hand and both coils drain through the one trap. Fig. 8 shows the first coil and trap location.

As the coils vary in condensation duty due to their location a differential in the amount of con-

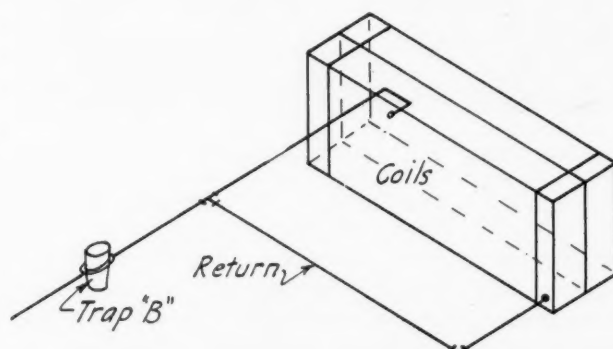


Fig. 9—Two coils are now in place with supply ends reversed as shown here. Only one coil trap is used (as shown) whereas two are needed.

densation causes one to unbalance them both at times. The result is a water hammer or knock. While this condition exists only at times, these hammerings and knocks have the uncanny faculty of happening between the hours of 2 and 6 a. m. The added trap will be installed during the next few days.

Another error was made in installing 30 degree check valves instead of 45 degree ones. The click or slap of the clappers is audible at times. (Fig. 3.)

It will be observed that none of these errors were the result of ignorance. They resulted from carelessness, unusual conditions, and lack of necessary time. They might happen to any designer or contractor.

The contractor installing such systems should obtain detailed drawings and full information from the manufacturers of the traps and valves.

Research Residence Facts

(Continued from page 32)

were not disturbed, but were connected to the top of the bonnet by means of two elbows of rectangular cross section with the turn made on the shorter dimension of the section.

Bonnet C was shaped somewhat like a truncated cone with the flat top $13\frac{3}{4}$ inches above the upper surface of the radiator. The two rectangular elbows connecting to the main air trunks rose from the top of the bonnet and the sides were sloped from the bottoms of the elbows to the top of the casing. The latter was on the same level as the top surface of the radiator, as shown in Fig. 4. A photograph of bonnet C installation is shown in Fig. 5.

F. Results of Tests on Three Types of Bonnets

The results of the tests are shown in Fig. 6, in which the capacity and efficiency of the three installations are compared on the basis of equal combustion rates. The values shown on the curves in Fig. 6 have been tabulated in Table III.

TABLE III

Performance of Three Types of Bonnets in Forced-Air System (See Fig. 6)

	Bonnet A	Bonnet C	Bonnet B	Baffle Furnace
Air Volume with same fan speed.				
	1675	1585	1525	1530
	c.f.m.	c.f.m.	c.f.m.	c.f.m.
Bonnet Air Temperature in deg. F.				
2-lb. rate	105°	105°	102.5°	108°
4-lb. rate	128°	128°	125°	140.5°
Capacity at Bonnet in B.t.u. per hour.				
2-lb. rate	69,000	69,000	62,000	69,500
4-lb. rate	115,000	115,000	106,000	125,000
Efficiency of furnace at bonnet in percent.				
2-lb. rate	87.5	87.5	78.5	86.5
4-lb. rate	74.0	74.0	69.0	79.0

Considering the bonnets alone, it is evident that the best results were obtained with bonnets A and C. The efficiencies, capacities, and bonnet air temperatures were practically the same for these two bonnets. The air quantity was slightly less for bonnet C than for bonnet A, indicating a slightly greater resistance to air flow for bonnet C. Bonnet B offered the greatest resistance to air flow, as shown by the decreased quantity of air circulated. This was also accompanied by the greatest static pressure, although the actual differences in static pressure were small. At a combustion rate of 4 pounds per square foot of grate surface per hour bonnet B showed a reduction in efficiency and capacity of about 8 per cent as compared with that for bonnets A and C.

A study of the temperature variation in the air at various points in the bonnets indicated that the temperature was comparatively uniform throughout bonnets A and C. Much greater variations were observed in the case of bonnet B.

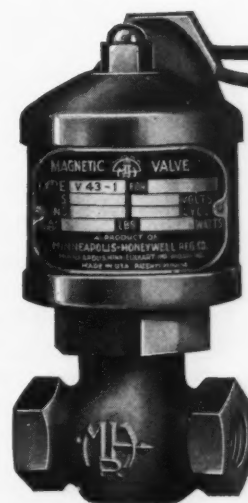
The estimated cost of bonnet A was \$10.50, of bonnet B \$11.75, and of bonnet C \$13.25. Hence it is evident that bonnet A was the most advantageous when all factors are taken into consideration.

G. Baffle Inside Casing

The baffle was inserted in the casing equipped with Bonnet C, as shown in detail in Fig. 4. This

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for
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Magnetic Shutoff Valve. Silent Solenoid valve with replacement seat and plunger. Especially designed for domestic air washers.

MINNEAPOLIS-HONEYWELL Air Conditioning Controls govern all phases of this work, including heating, cooling, ventilating, humidifying or de-humidifying. There are controls for every application, each designed to accomplish its particular function with characteristic Minneapolis-Honeywell accuracy and efficiency. Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, Minn. Branch and distributing offices in all principal cities.

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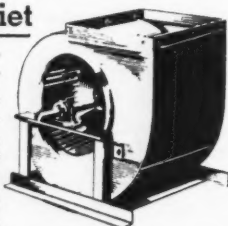


Any Size and Any Width

For furnace manufacturers who buy wheels only, Clarage offers any size desired, and can meet any quantity requirement. Clarage Wheels can be furnished standard width as shown at left, or any percentage of standard width to deliver a specified volume of air at any desired operating speed. All wheels are PERFECTLY BALANCED BOTH STATICALLY AND DYNAMICALLY. They run smoothly and quietly without vibration. Special wheels of special metals can be furnished.

Low Speed and Quiet

Clarage Furnace Fans combine many advantages. They are positive in performance, centrifugal type, very compact, highly efficient, and the low speeds insure SILENT OPERATION. Built as shown at right, or with inlet boxes added. Inlets and outlet are drilled with holes for easy attachment to ducts.



Clarage Fan Company, Kalamazoo, Mich.

CLARAGE
Air Handling and
Conditioning Equipment

THE AUTOMATIC BUTLER COAL STOKER

together with the hard-hitting, point-of-sale merchandising program behind it, quickly establishes dealers in this flourishing new field of business. For instance, one Butler dealer in 8 weeks was selling neck and neck with competition in the business 8 years. Write for the Butler dealer proposal now.



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SIZES

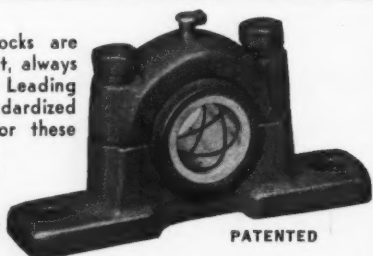
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973 Sixth Ave. S. E.
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● Randall pillow blocks are always in alignment, always perfectly lubricated. Leading manufacturers have standardized on Randall bearings for these reasons. Their installations are quiet and trouble-free.

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BLOCKS

Self-Aligning
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RANDALL GRAPHITE PRODUCTS CORP.
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baffle was an angular ring 23 inches high, with the vertical sides spaced $3\frac{1}{2}$ inches apart. The top and bottom surfaces were vented with one inch holes spaced 3 inches between centers, to permit the circulation of some air through the annular space. This baffle was placed with the bottom about one inch above the grate level and the top 5 inches below the lower surface of the radiator. The outside surface was one inch from the casing and the inside surface $5\frac{1}{2}$ inches from the top ring of the firepot.

The performance results obtained with the use of the baffle are shown in Fig. 6 and Table 3. The

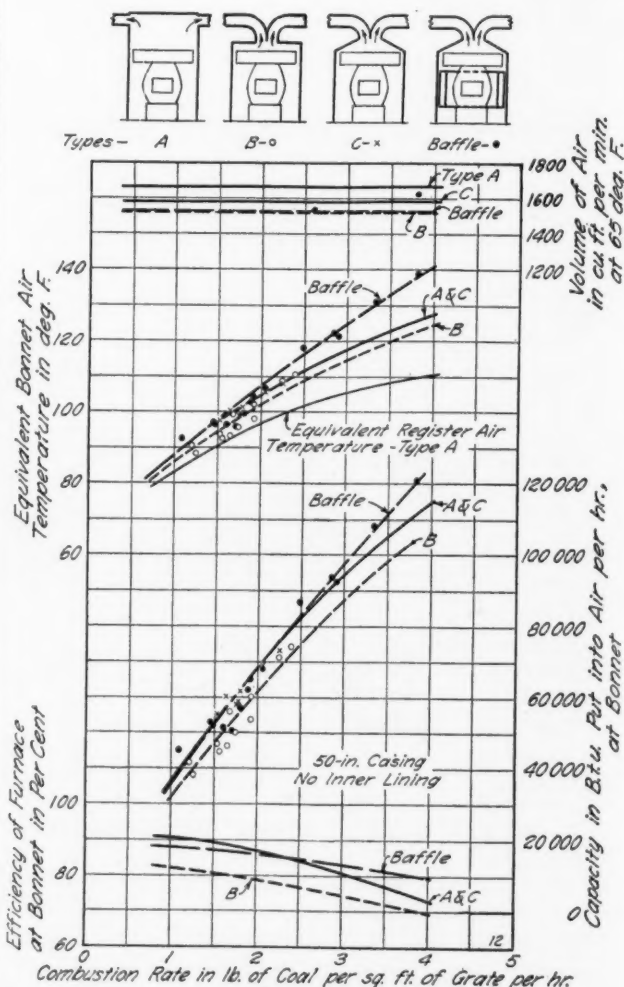


Fig. 6—Performance curves with three types of furnace bonnets and one type of baffling. Note general pooriness of type B and performance of baffled casing.

insertion of the baffle in the casing when bonnet C was in use resulted in an increase in resistance and a decrease in the quantity of air flowing. However, at combustion rates above 2.5 pounds per square foot per hour, the baffle effected an increase in both efficiency and capacity. This was caused by the fact that the baffle acted as a radiation shield and at higher combustion rates the temperature of the casing was less with the baffle than it was when the baffle was not used. Hence the radiation loss from the casing was less. It is probable that the baffle would have shown similar results if it had been used in connection with bonnet A.

H. Baffles for Intermittent Firing.

Although no test data are available at the present time on the effect of baffles for intermittently fired

plants (such as oil-fired, gas-fired, and coal stoker plants) it seems highly probable that the use of baffles would be even more effective than for the case of intermittently fired plants, where the combustion rate varies with the weather.

The data presented in Fig. 6 and Table 3 indicated that baffles were most effective at higher combustion rates. Since intermittently fired plants are set to operate at a fixed combustion rate that is sufficient to take care of the heaviest heating load, the combustion rate during periods of burner operation is always at a maximum value.

I. General Notes on Baffling.

1. The ordinary casing used for gravity warm air furnaces is usually much larger than that suitable for furnaces used in forced-air systems. Where such large casings are furnished, the use of inner baffles is recommended to restrict the free air passage so as to cause the air to impinge.

2. The use of rectangular casings in place of the common circular casings makes the use of baffles a necessity, and particularly at the corners.

3. Baffles are used primarily to prevent the short-circuiting of the cool return air up the sides of the casing. The air passages inside the casing are usually restricted so that the width of the air passage does not exceed approximately 4 or 5 inches.

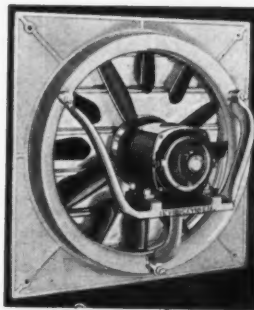
4. Inner casings or linings are also used in conjunction with baffles to minimize the heat loss from the casing to the basement air.

5. It should be recognized that any obstruction to the air flow tends to introduce resistance, against which the fan must deliver the air. Consequently, a compromise must be reached between increasing the air velocity over the castings and keeping the resistance within reasonable limits.

6. All baffles should be ventilated at the top and bottom with small holes (say one inch in diameter) to allow some air to pass through the baffling and keep the temperature of the metal down to a minimum value.

7. In a normal installation, the hottest part of the casing is usually towards the back, immediately over the connecting air passage from the fan. The air delivered by the fan has a tendency to blow towards the front part of the furnace casing. Efforts directed towards turning the air quickly and smoothly up into the rear portion of the casing should, therefore, tend to make the heating surfaces located at the rear of the casing more effective.

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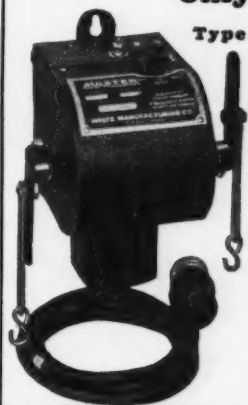
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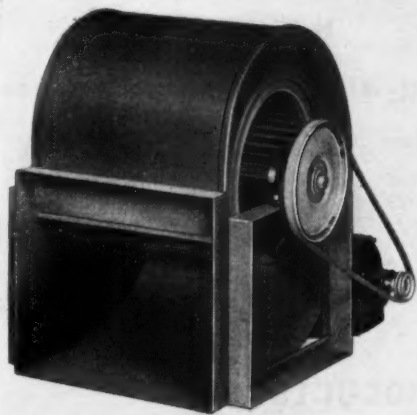
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Priced low enough for the volume market; sturdy, quiet, efficient. Four-pole 16-volt induction motor. Small transformer mounted outside housing. Write for Complete Details.

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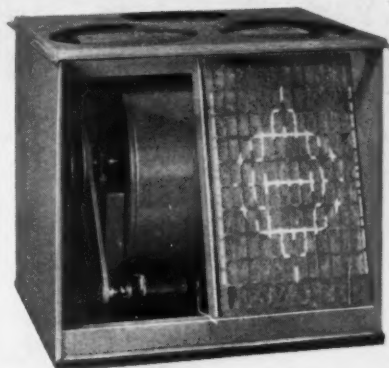
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**A Modified Air Conditioner
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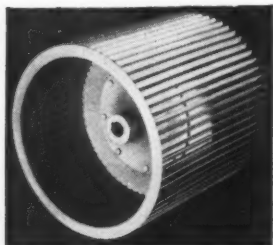
Get the facts about Properaire Furnace Blowers for Modified Air Conditioning, including filtering. Installation costs are low for either new or old systems. Properaire comes in 3 fan sizes . . . 10, 12 and 16 inch. Gives efficient heating when furnace is operating and lowers temperatures in summer months.

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for furnace blowers, air-conditioning units, stokers, oil-burners, etc. Always dependable, reasonably priced. Let us quote on your requirements.

Write for proposition on full air conditioning line.

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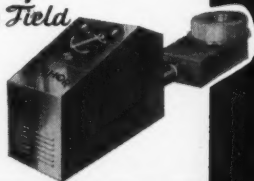
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Best engineered stoker on market today. Attractive design appeals to eye; economy and performance appeal to purse. Easily installed in any heating plant now in service. Designed for homes, churches, green-houses, hotels, apartments, schools, laundries, dry-cleaning plants, factories, store-buildings, etc. Made in 17 sizes; complete coverage from homes to 400 h.p. boiler plants. Tremendous sales possibilities for wide awake distributors and dealers. Write for full information.

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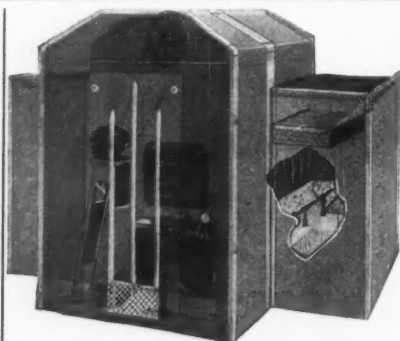
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NEW ALBANY ESTABLISHED 1865 INDIANA

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Made to order when necessary in any special size desired.

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Oil Fired Complete 8-Stage Air-Conditioning Unit Including Cooling

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MR. DEALER— When you sell Dailaire equipment you are selling your customers more radiating surface, chrome steel dome with divided flue construction—Blowers on the top of unit, all of which give 20 to 40% greater efficiency, and require less floor space—Our extended casing which houses motor and burner makes the unit attractive, neat and compact.

Dailaire units are field tested through five Winters, and is a line that will meet all requirements large or small and is one on which you can build a staple and profitable business.

Write now for complete agency plan while your territory is still open.

DAIL STEEL PRODUCTS CO.

1050 Main St.

Lansing, Michigan

Humidity and Health

(Continued from page 34)

amount of moisture to be added, especially during a period of low outside temperature. Taking the lowest point on the outside temperature curve which is 13 degrees F., we have added 2.25 grains of moisture per cubic foot with a resultant relative humidity of only 30 per cent. With 12,600 cubic feet as the volume of space heated including the basement, and assuming one air change per hour due to infiltration we have,—

$$2.25 \times 12,600 = 28,400 \text{ grains of moisture added per hour.}$$

$$28,400 \times 24 = 680,000 \text{ grains added per day.}$$

$$680,000 = 97 \text{ lbs. or 11.7 gallons of water per day.}$$

$$7,000$$

Therefore, even with a rather low inside relative humidity it is necessary when the outside temperature is low to evaporate a large amount of water. To have obtained an inside relative humidity of 40 to 45 per

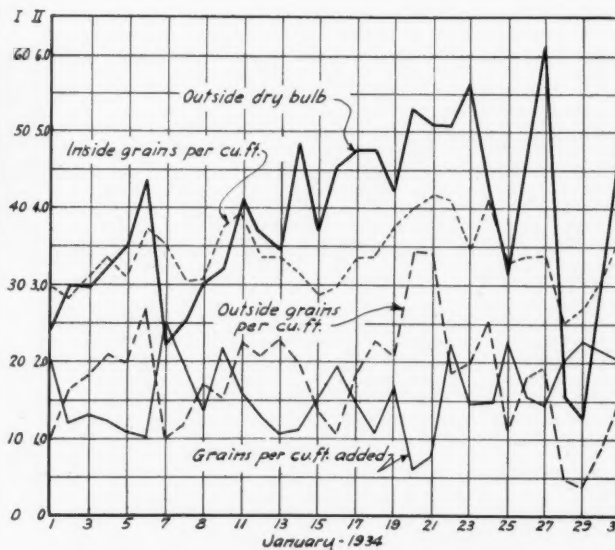
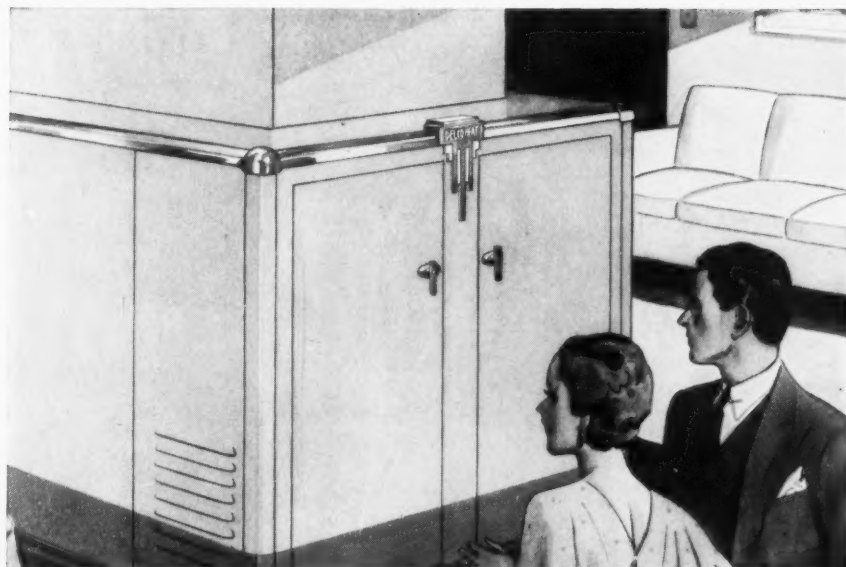


Fig. 2—This chart, prepared by the author, shows the grains of moisture per cubic foot of air for inside and outside conditions. Note how moisture added proceeds in opposite swings from the outside relative humidity line.

cent would, of course, have required considerably more water. It is very easy to see how inadequate the average warm air furnace humidification facilities are.

LET'S LOOK *Inside* THE NEW DELCO-HEAT CONDITIONAIR



With Delco-Heat Conditionair, the air is first purified—removing dust, destroying bacteria; then healthfully humidified to just the right degree; automatically heated; and gently circulated throughout the building with a complete change of

air every 10 to 15 minutes. During the summer Delco-Heat Conditionair substantially contributes to healthful comfort by destroying bacteria and removing pollen from the inside air and circulating freshened, invigorating air into the building.

For installation in new homes—or for replacement in existing homes using warm air systems—the Delco-Heat Conditionair is an ideal investment in heating equipment.

It combines new-day conditioning of the air with the best in automatic heating. Operating costs are lower than with other types of heating plants, because of its scientifically designed unit construction and the utilization of the famous Delco-Heat method of burning the lowest cost domestic fuel oil.

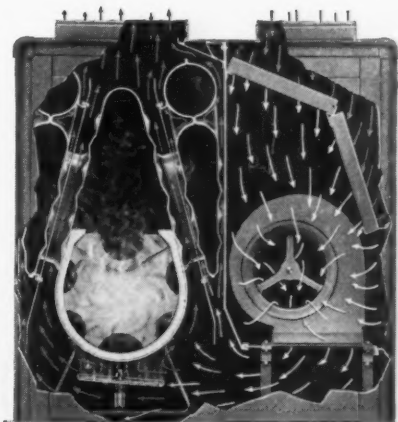
In the merchandising and installation of this type of equipment, the makers and distributors of Delco-Heat cooperate to the fullest extent with warm air heating and sheet metal contractors and dealers.

We shall welcome an opportunity to give you complete details about our products and our policies. Please use the coupon below.

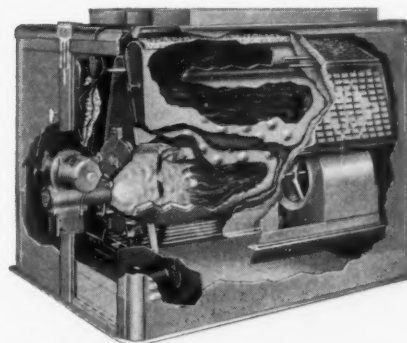
DELCO-HEAT *Conditionair*

A PRODUCT OF GENERAL MOTORS

A complete line of automatic oil heating equipment for domestic and commercial applications.



Cross-sectional view shows the direction which the air takes in passing through filters and blowers; thence to humidifier and stream-lined heat transfer unit. Streamline construction reduces resistance to air flow. Projectors transfer maximum heat. Combustion chamber refractory liberates stored heat after burner ceases operating.



In the Delco-Heat Conditionair are four filters which contain specially treated strands of blown glass covered with an adhesive material. The incoming air must first pass through these filters—where dust, dirt, pollen and bacteria are removed; then large capacity centrifugal blowers, operating quietly, circulate this purified, freshened air.



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Subsidiary of General Motors
Dept. 12-M, Rochester, N. Y.
Send facts about Delco-Heat Conditionair.

Name

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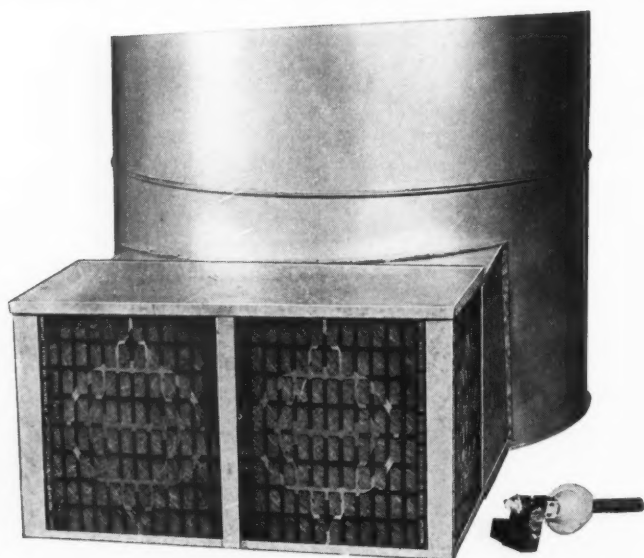
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- () Warm air heating contractor and dealer
() Sheet metal contractor
() Air conditioning dealer

OSBORN

AIR CONDITIONER BOOSTER

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- EASY TO INSTALL
- A REAL PROFIT BUILDER

STANDARD EQUIPMENT

4 Dustop Filters—Automatic Fan Switch
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Complete—Emerson Furnace Fan.

MADE IN TWO MODELS

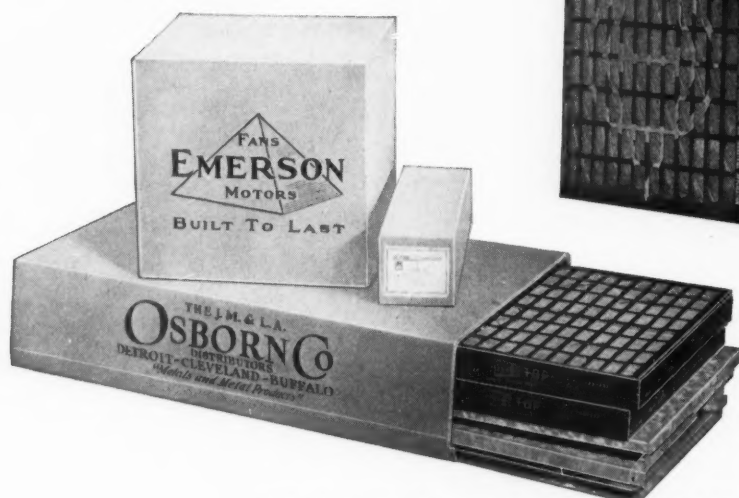
Model 21. Capacity 1050 CFM—1100 RPM—65 Watts—

Shipping weight 120 pounds. List Price..... **\$48.00**

Model 61. Capacity 1275 CFM—950 RPM—90 Watts—

Shipping weight 130 pounds. List Price..... **\$53.00**

For two-speed fan operation an EMERSON three-speed regulator can be added at a small additional cost.



The complete Osborn Air Conditioning System in its shipping carton, showing the simplicity for shipping purposes. It is the most compact, efficient and sturdy unit on the market, and is priced within the reach of most all home owners.

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An American Artisan
Survey

Code Authority Committee Reports

Month by month various code authorities are getting their areas and organizations perfected. The progress made has not always been just as anticipated. This month's section reports some new developments of particular interest. Your reports are invited.

N. I. R. A.

The National Industrial Recovery Board has issued regulations which must be followed by all code authorities in handling money collected for code administration.

The text of the order prescribing the rules follows:

"Pursuant to the authority vested in it by Executive Order Number 6859, and otherwise, the National Industrial Recovery Board does hereby prescribe the following regulations applicable to all Code Authorities with respect to funds and accounting.

"A. Each Code Authority shall promptly provide for:

"1. The designation of a person or persons who shall receive and account for all funds.

"2. The furnishing of adequate security by such person or persons for the protection of funds in his or their custody.

"3. The maintenance of Code Authority funds in its name and separate from all other funds.

"4. The keeping of accurate and adequate accounting records, available at any reasonable time for inspection by accredited representatives of the National Recovery Administration.

"5. The submission of periodic reports to the National Recovery Administration at such times as it may require.

"6. An audit at the expiration of each budget period by a competent independent auditor, as defined in Paragraph C hereof, such audit to be acceptable to the National Recovery Administration.

"7. The publication or distribution, not later than sixty days after the budget closing date, to those members of the trade or industry who have paid assessments or otherwise contributed funds to the Code Authority, of a report of its financial operations for the budget period, its financial position at the closing date thereof and of its activities in the said period; and the filing of a copy thereof with the National Recovery Administration.

"B. Each Code Authority shall

furnish such information regarding its observance of the provisions of this Order as the National Recovery Administration may deem necessary to insure compliance therewith, and any action by a Code Authority hereunder, if found by the National Recovery Administration not to be in accord with this Order is subject to its disapproval.

"C. As used in Paragraph A, 6, hereof the term competent, independent auditor means a public accountant in good standing who is either a certified public accountant or has the equivalent in ability of a certified public accountant, provided, however, that as to any service to be performed in any particular state or governmental division of the United States, such accountant, in any event shall have the qualifications required by law in such state or governmental division of the United States for the performance of such service; this term further means an accountant who is in fact independent of the Code Authority whose accounts he audits. Unless the National Recovery Administration permits otherwise, it will not recognize a public accountant as independent with respect to any Code Authority if (a) such public accountant, his firm or anyone in his employ has any interest as an officer, agent or employee of such Code Authority or, (b) such public accountant, his firm or anyone in his employ is an officer or employee of any member of the trade or industry under such Code Authority or of any trade association of such trade or industry."

Philadelphia

The Code Administration Board of metropolitan Philadelphia has used the letter herewith to follow delinquents in paying the assessment.

NOTICE TO THOSE NOT HAVING PAID CODE ASSESSMENTS

On October 9th and again on October 24th, we sent you a notice of a National Assessment Bill, to fill out and return with your payment of one (1) per cent of the business you did from May 25th to August 25th, 1934.

A number of the trade, representing almost one-half of the volume done in Phila. County, have already mailed in their reports and checks, BUT YOU have not paid any attention to this request nor made any explanation.

The members of the Code Administration Board of Phila. County are in the same business as you are; receive no money for their services or expenses; and have paid this assessment bill.

After this Board had examined the names of those remaining who have not paid their assessments and have not sent in their statements, it hesitated to turn in these names to the

Legal Department of the Code Administration, which they are duty bound to do after November 9th, under instructions received from NRA, Washington, D. C., without first giving YOU another chance to pay your part and to save you considerable embarrassment and loss of time.

In case you do not thoroughly understand the purpose of this assessment we want to make it clear to you. The one per cent National Assessment, approved by the Administrator at Washington, is to cover the expenses of Code enforcement, and the one per cent was approved because no one knew the amount of business done in the country by our trades and is merely a measuring stick to gauge the fair proportion each member should pay in the future, as explained in the enclosed news letter from the National Code Authority. If the amount received covers the largest part of the budget, which was approved by the NRA Administrator, the balance will be collected in smaller assessments. The amount of your Code Assessment payment must legally be added to your bills as others are doing, and therefore costs you nothing.

We cannot believe that any honest business man would care to do business under the old conditions, which the Code will wipe out. Already much improvement has been reported, and while some matters have lagged due to the need of study and approval, this Board is making considerable progress which will soon be felt by every honest and intelligent business man in the trades, if he will cooperate.

Trusting you will give this your serious consideration and mail or bring your code settlement to the code office AT ONCE.

Indiana

BY LAWS, STATE CODE ADMINISTRATION BOARD

The State Code Administration Board shall be composed of the District Chairmen from the respective Districts, plus one member-at-large elected by the Board. The members shall serve for three (3) years, the terms for the Richmond, Bloomington, Terre Haute, and Fort Wayne Districts expiring in January, 1936. Those for the Gary, Lafayette, Muncie and Vincennes Districts shall expire in January 1937. Those for the Indianapolis, South Bend, and Columbus Districts, and Delegate-at-large, shall expire in January 1938.

This Board shall select its Chairman, Vice-Chairman, Secretary and Treasurer. The Chairman and Vice-Chairman shall be Board members, but the Secretary and Treasurer need not be members of the Division.

This Board shall maintain a Central Office in Indianapolis, with telephone and clerical service, and a secretary for the uses of the Code Administration.

This Board shall decide such questions as are appealed to it by the respective Districts, and shall levy assessments for the administration of the Code, against all members of the Division in Indiana, with the approval of the National Code Authority and the Administrator. It shall fill vacancies caused by death, resignation, or removal until the next regular election.

This Board shall have the power to remove any officer, committeeman or employee in the

Code Authority Reports

State, District, or County Code Administration, for failure to function, or for any other good and sufficient reason.

At the Annual Meeting, every Indiana member of the Division present, shall be entitled to cast one vote. Votes shall be by Districts, and each District shall count one vote for each paid up member of the Division in its territory. The votes of each District shall be cast together but split votes shall be allowed, and shall be counted on a pro rata basis. The Annual Meeting shall preferably be during the third full week in January, at such time and place as the Board shall designate.

Mail votes may be taken by the Secretary, with the approval of the Chairman. No proxies shall be recognized, either of members of the Division, or of members of this Board.

These By-Laws may be amended at any time by submission of the proposed amendment by the officers of this Board to the respective Districts, and such amendment shall become effective if approved by seven Districts within 30 days after submission.

BY-LAWS (INDIANA) DISTRICT NAME

This organization shall be known as the District of the Indiana Area S. W. R. TERRITORY

The jurisdiction of this organization shall be within the following Counties in Indiana:

OBJECTS

The objects of this organization shall be to assist the National Recovery Administration so far as its activities are concerned, with the Sheet Metal, Warm Air Heating, Roofing and Reroofing Industries within its jurisdiction.

To formulate plans for the proper educational organization and enforcement activities.

To provide means for the collection, allocation and disbursement of funds necessary to attain the objects desired.

To hear, carefully investigate and adjust complaints.

To protect Sheet Metal, Warm Air Heating, Roofing and Reroofing contractors, their employees and their customers, from unfair trade practices, unnecessarily dangerous methods of operation, and unreasonable prices, and to do whatever else may be required and necessary to carry out the intent of the NRA and within the scope of the laws of the land, and regulations of the NRA.

MEMBERSHIP

Any member of the Division as defined in Chapter VII of the Construction Code in this District, shall be eligible to membership. If its dues and assessments are paid up to the end of the quarter immediately preceding, it shall be considered a paid up member.

OFFICERS

The officers of this organization shall be as follows:

A District Code Administration Board, made

up of the Chairman of the respective Counties. Also a Chairman selected by the District Board, subject to the approval of the State Annual Meeting, and

A Vice-Chairman

A Secretary

A Treasurer, selected by the District Board subject to the approval of the State Board, who may or may not be members of the Board, and who, excepting the District Chairman, need not be members of the Division. The Treasurer shall be bonded for not less than Five Hundred (\$500.00) Dollars. He shall remit all funds to the Treasurer of the State Code Administration Board, excepting those set aside by the State Board for District expense.

All officers shall serve for one year, excepting the District Chairman, who shall serve for three years.

REMOVAL OF OFFICERS

Any officer or employee may be removed at any time by the State Code Administration Board for failure to function or for any good and sufficient reason.

VOTING

Each paid up member of this organization shall cast one vote on all questions.

Votes shall be by Counties, and each County shall count one vote for each paid up member of the Division in its territory. The votes of each County shall be cast together, but split votes shall be allowed, and shall be counted on a pro rata basis.

DUES AND ASSESSMENTS

Shall be fixed by the District Code Administration Board, subject to the approval of the State Board and National Code Authority.

STANDING COMMITTEES

Subdivision—There shall be one Committee for each Subdivision included under Chapter VII of the Construction Code. This Committee shall be made up of one person from each member firm of this organization specializing in that particular type of operation. To this Committee shall be referred all questions relating to its particular subdivision. It shall pass on such questions, and report to the District Trade Practice Complaints Committee, for approval. If the District Board does not approve, the Committee may at its option, appeal to the State Code Administration Board.

There shall be two Labor Committees, one made up of one representative from each Union Shop, where such group is represented, and one made up of one representative from each non-union shop among the membership. To each committee shall be referred all labor questions coming under the Code, affecting either the Union or non-union groups respectively. Each Committee shall report on each question to the District Trade Practice Complaints Committee for approval. If the District Trade Practice Complaints Committee does not approve, the Committee may at its option appeal to the State Trade Practice Complaints Committee.

It shall be the duty of each Labor Com-

mittee to contact the employees of its particular group, arranging for truly representative meetings.

Committees on Code enforcement, investigation and cost determination, shall be appointed by the District Chairman, subject to the approval of the State Code Administration Board.

The District Chairman shall select the chairman of each Standing Committee. Each Committee may also at its option, elect a truly representative executive committee of five (5) members, and clothe it with any or all the powers of the general committee. The chairman of the general committee shall be the chairman of the executive committee.

The Secretary shall be secretary of all committees, and the District Chairman shall be a member ex-officio of all committees.

TRADE PRACTICE COMPLAINTS COMMITTEE

The District Trade Practice Complaints Committee shall be made up of the District Chairman, who shall be its chairman, the Vice-Chairman, the Secretary and the Treasurer of the District Board.

MEETINGS

Committee Meetings shall be at such times and places as are designated by the committee chairman.

Regular Monthly Meetings shall be held preferably at the District Office at the same specified time each month. They shall be open to all paid up members of this organization and shall be combined meetings of all committees.

Other Combined meetings of two or more committees shall be called when necessary by the District Chairman.

ANNUAL MEETING

The Annual Meeting shall be held on the first Wednesday preceding the State Meeting. It shall be open to all members of the Division within the District.

Five (5) days' notice shall be given to all Districts.

DISTRICT OFFICE

A District Office shall be maintained, with telephone service, at the office of the District Chairman or other convenient and accessible location.

MAIL VOTES

No mail vote shall be taken excepting with the approval of the Secretary of the State Code Administration Board, and no proxies shall be recognized.

QUORUM

Ten voting members shall constitute a quorum at any regular meeting, provided that 50% of all of the Counties are represented. Five voting members shall constitute a quorum at any meeting of a committee of ten or more members. A majority shall constitute a quorum at any meeting of a committee of less than ten members.

AMENDMENTS

These By-Laws may be amended at any time by submission of the proposed amendment by the officers of this Board to the respective Districts, and such amendments shall become effective if approved by 7 Districts within 30 days after submission.

Philadelphia's Code Experience (Continued from page 20)

10. No member shall submit an estimate price on any job without retaining a record thereof, or submit a bill for his services without retaining an actual and correct record thereof.

11. No substitution of material is allowed; no rebates; commissions or other gifts are to be given for commercial bribery.

12. All gravity warm air heating must be done according to the Standard Code for Gravity Warm Air Heating for residences.

We have found that at first, due to the present conditions, the aver-

age-sized shop will receive the greatest benefit from Code compliance because of residential repairs and replacement.

Actual experience is showing many ways in which the Code, Code Board and office may be made of considerable extra assistance such as furnishing a path by which any Local Trade Association may be perfected to a high degree for service in the future.

During our short experience with the Code it is interesting to note how those who previously "cut" their way to business, have now

become chief suggestors of things for the NEW order under the Code. What at first seemed hopeless confusion is now becoming regular routine. The general spirit of co-operation shown speaks well for the future.

Have there been serious objections? Certainly; from vexing problems to down-right stubbornness. Gradually these are rapidly being overcome. It has required hard work and long hours and much time, but the general improvement has made it well worth while. It is almost certain that the next six months will bring much greater benefit to everyone concerned.

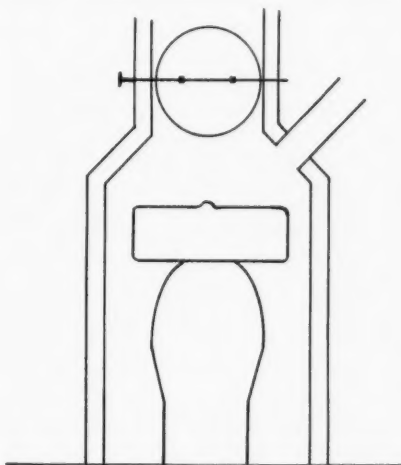
...the problem corner

Heat Robber Answer

American Artisan:

Your December issue brings to the front again "tap" pipes for pipeless furnaces.

It should be borne in mind that when such an outlet is added to a pipeless furnace it is no longer a pipeless furnace. Mr. Anderson's article is one of the best published because it calls attention to the probable destruction of the radiator when using robbers. It would be extremely painful to the writer to narrate all the grief encountered while trying to make "taps"



work on twenty-five pipeless furnaces sold by one of our agents many years ago. The agent had used a "tap" shown in a trade paper at that time.

Our company now recommends placing a quadrant lock damper in the main air pipe substantially as shown in the accompanying sketch. The damper can be adjusted to meet the requirements in each case. The writer knows of one "tap" twenty-four feet long doing acceptable work. It is, however, well insulated.

The openings where leader passes through canopy should always be tight enough to prevent leakage.

Incidentally, why should anyone install a pipeless, either with or without extra pipes, for residence work?

L. W. Millis, Secretary,
Security Stove & Manufacturing Co.,
Kansas City, Mo.

Greenhouse Heating

American Artisan:

Will you be kind enough to tell me if it is possible to heat a greenhouse with a warm air system. Also if it is practicable to do so?

Any information you can give will be appreciated.

R. G. G., Province of Quebec.

Reply by The Editors

We have never seen a greenhouse heated by warm air. A check among heating men here in Chicago reveals that all of them believe that such a system is not feasible.

The conditions required for greenhouse heating are—high or fairly high humidities, high or fairly high temperatures, low air motion. Any system must also supply a heavy load of heat to compensate for the high heat loss in such a building.

While it is practicable to supply any heat loss, a warm air system would have to carry tremendous quantities of air at temperatures around 70 to 80 or else raise the air temperature and diffuse the incoming air.

Radiation is ordinarily run under the plant benches or along the aisles and along all outside walls, thus keeping the dirt warm and killing the effects of large areas of cold glass surface.

Perhaps some readers have handled such a problem and we will submit the question to them. Has anyone some suggestions?

Does Fan Save Fuel?

American Artisan:

Will you please tell me if there is available data showing any increased fuel economy made possible by using a fan or blower on an existing gravity plant and without altering in any way the distribution of return air pipes.

S. H. B., New York.

Reply by the Editors:

The best information we have on this subject was secured by elaborate tests over many years' time at the Research Residence of the National Warm Air Heating and Air Condition-

ing Association at the University of Illinois, Urbana, Illinois. Tests were conducted by the Research Residence staff of the Engineering Department of the University. These tests go into rather elaborate detail but the conclusions to be drawn may be summed up as follows:

1. The use of a fan having a greater air delivering capacity than that normally produced by the gravity system operated at corresponding combustion rates, results in decreases in register air temperature, increases in capacity at the furnace bonnet, and increases in furnace efficiency, but not necessarily in increases in fuel economy or saving in fuel required to heat the house, as compared with the register air temperature, capacity, and efficiency obtained with the gravity system.

2. In combination gravity and fan systems, the capacity of the fan as installed must be greater than the volume of air that would be delivered by the same system operating on gravity at the register air temperature that would be required to heat the building in the most severe weather prevalent in the given locality. Otherwise, the fan system, over the lower range of outdoor temperatures, will operate with higher register air temperatures than would be required by the same system without the fan.

3. If a propeller type fan is installed in the cold-air shoe it should be shrouded to cause all of the air to pass through the blades at all times when the fan is in operation. When the fan is not in operation the shrouding should be by-passed in order to prevent interference with gravity flow.

4. With intermittent fan operation the heat stored in the castings and fuel bed may be utilized as a source from which to obtain an immediate increase in the heat delivered at the registers for a short period after the fan is started.

5. Considerable resistance to the flow of air by gravity may be offered by the presence of the idle fan.

6. The rate of heat transfer from the heating surfaces to the air may be influenced by the type of fan and the method of installation.

ASSOCIATION

Activities

New York State

To Sheet Metal & Roofing Contractors of the United States:

All organizations or associations of an industrial nature are naturally formed for the protection and advancement of whatever particular industry they represent. The New York State Sheet Metal & Roofing Contractors' Association has been in existence for some twelve years and has had as its objective the promotion of the sheet metal and roofing industry in this State.

In this State, as in other States, mail order houses and direct-to-you concerns are offering a serious menace to the sheet metal and roofing industry and after due consideration the officers and directors of this association have decided to lay before the sheet metal and roofing contractors of the entire country facts and figures which might not be known at the present time and which might prove of interest.

The Code of Fair Competition for the Warm Air Furnace Manufacturing Industry defines two classes of buyers—namely, jobbers and dealers. A **Jobber** is defined as "anyone whose sole business is to sell to dealers, heating contractors, and/or installers and who does not perform directly or indirectly, the functions of a dealer, heating contractor or installer."

A **"Dealer and/or Heating Contractor, and/or Installer"** means anyone who buys the products of the Industry for resale to the consumer and/or installation in connection with such sale."

Because of the fact that mail order houses and direct-to-you concerns sell to the consumer they are classified as dealers under this Code.

In New York State, one mail order house in some instances has advertised a cast iron furnace, complete with casings and top, of sufficient size to heat 4500 cubic feet of air at a price of \$49.85, which also includes an automatic humidifier. In some instances in the western states the price on this same cast iron furnace has been \$39.95. They have also advertised a 22" steel brick lined furnace for \$89.95.

Most 18" pot cast iron furnaces with casings and tops cost the legitimate dealer \$45.75—while the 22" steel, brick lined furnaces with casings and tops cost \$88.00.

The Code provides that manufacturers file with the Code Authority for distribution to members of the industry the price at which they sell to jobbers or dealers. The following manufacturers have filed prices applicable to dealers who placed an order for 1,000 or more furnaces during the calendar year of 1934. These are the prices at which mail order houses buy furnaces.

The Agricola Furnace Company, Gadsden, Alabama

This company has regular dealer prices on cast furnaces practically the same as most other manufacturers. On a separate sheet they offered dealers who purchased 1000 or more furnaces during the calendar year the maximum quantity discounts shown on their regular dealer sheet No. 125, dated March 27th, 1934 of 5-5-5 & 5% and a Special Discount of 21½%. This discount amounts to a little more than 36% below their then prevailing price to dealers why buy in small quantities.

The Williamson Heater Company, Cincinnati, Ohio

This company has regular dealers' prices on cast furnaces, practically the same as most other manufacturers. On a separate sheet they offer dealers who purchase 1000 or more furnaces during the calendar year the maximum quantity discounts shown on their regular dealer sheet, No. 3, dated March 26th, 1934 of 5-5-5 & 5% and a Special Discount of 21½%. This discount amounts to a little over 36% below their prices to dealers who buy in small quantities.

L. J. Mueller Furnace Company, Milwaukee, Wisconsin

[This company withdrew special 1000 unit prices several weeks ago.]

Michigan Tank & Galvanizing Company, Detroit, Michigan

This company has regular dealers' prices on steel furnaces practically the same as most other manufacturers. On a separate sheet they offer dealers who purchase 1400 furnaces during the calendar year the maximum discount shown on their regular dealer sheet No. 11, dated May 1st, 1934 of 15% and a Special Discount of 22-10-5-5 & 5%. This discount amounts to a little less than 49% below their prices to dealers who buy in small quantities.

The manufacturers who are offer-

ing the above discounts are those who are catering to mail order houses. When mail order houses can buy at these extremely low prices they can undersell most dealers and still make a satisfactory margin of profit. There is nothing in the Code of Fair Competition for the Warm Air Furnace Manufacturing Industry that can control the prices at which mail order houses or dealers sell to the consumer.

In addition to the fact that mail order houses sell to the consumer at prices that the average dealer cannot meet and make a profit, the mail order houses have liberal terms to offer. They usually deliver free within 25 miles of the store; they include an automatic humidifier and also render engineering and installation service.

The following letter was sent by this office to the above named concerns on October 19th and the Michigan Tank & Galvanizing Company was the only one who replied to our letter.

"I have recently seen the list published by manufacturers of warm air furnaces (as provided for by the code) on the discounts allowed to dealers. I note that your discount to purchasers of 1000 furnaces during the year is —% lower than your price to small dealers. I know that outside of the mail order houses, there isn't a jobber or dealer in the country moving 1000 furnaces a year. I understand that you are supplying mail order houses with furnaces and believe that your low price was filed for the sole purpose of securing the mail order house business.

"I wish to enter the protest of this Association against the continuation of such ridiculously low prices, inasmuch as such practices are creating a very unsavory condition for the legitimate installers of such equipment throughout the country.

"The legitimate dealer is the man who has placed the furnace business on its present secure footing. You undoubtedly are showing a profit when you sell furnaces to mail order houses at the above mentioned discount. Why make it harder for the legitimate concern to stay in business by asking them to pay —% more than a competitor?

"I am wondering if you have informed the dealers who have been loyal to you for years of the disadvantage you have placed them under? Do you think they would continue buying your products if this information was brought to their attention?

"The mail order house cannot purchase copper or galvanized sheets at lower prices than the legitimate jobber. We also have information to the effect that other manufacturers have

Association Activities

quoted their regular prices to mail order houses.

"If you believe that such a discount does not work a hardship on the legitimate dealer, we believe it no more than fair that you notify such dealers of your entire range of discounts and then let them decide if you have been giving them a fair break.

"I will appreciate hearing from you by return mail as to your intentions."

The Michigan Tank & Galvanizing Company said, in part. "We do not believe it is of interest to anyone as to what prices the mail order houses purchase their furnaces, providing their prices are higher than the dealer prices for the same equipment" and "As to our dealers being informed of the prices we have been quoting the mail order houses wish to inform you that we have no dealer organizations and our entire output is taken by a few well known outlets."

If the legitimate contractor is to successfully compete with the mail order houses it means that we must be satisfied with a profit of from \$2.00 to \$4.00 on the furnace.

Mail order competition is difficult, if not impossible, for the average dealer to meet. The manufacturers who sell mail order houses also sell other dealers. If these manufacturers were deprived of all of the dealer and jobber business in the country and had to rely solely on mail order business, we are of the opinion that they would not be able to sell to mail order houses at as great a discount below their dealers prices as they now sell. As we see it, these manufacturers are not in the business of making their product solely for the mail order houses, but they are attempting to hold both markets to get all the benefit of sales through jobbers, dealers and contractors and at the same time to sell a substantial volume to mail order houses. We believe it proper for each heating contractor, jobber or dealer to determine for himself whether he wishes to help these manufacturers carry along this unfair price structure or whether he will decide to purchase only from the manufacturers who do not have this additional volume price.

We request the wholehearted support of readers of this bulletin and urge you to send us your comments on it and to let us have any suggestions for the successful continuation of this battle. Incidentally, we will not hesitate to expose any concern supplying mail order houses with sheet metal, roofing or heating supplies, who, at the same time, solicits business from legitimate contractors.

Adolph Hesse, Secretary.

Du Page County, Ill.

A short time ago our association adopted a resolution which initiated a movement toward licensing Warm Air Heating Contractors in the State of Illinois. This resolution was motivated by high and sincere principles, being mainly:

To offer a measure of protection to the public in its transactions with contracting members of the Warm Air Heating Industry;

To retard, if not prevent, unscrupulous, incompetent and itinerant persons from representing themselves as contracting members of the Warm Air Heating Industry; and

To enjoy the reward and prestige that may be ours from a competent public service in making homes comfortable.

We were encouraged to carry this movement forward and finally drafted a proposed law, a copy of which has been sent to associations throughout the state. While all associations have not yet expressed themselves, all responses, except one, have approved the movement.

Public protection is the first requisite for licensing. In our industry it applies to fire, health and investment hazards. These three factors are closely related to our competency as an industry. Fire hazards are increased by lack of knowledge or by disregard of fire protective measures. Improperly installed smoke pipes and inadequate systems which require forced firing are causes under this factor. Health hazards are increased, similarly, because of gasing. Investment hazards relate to the final value of the purchase. Obviously, an unsatisfactory system never fulfills the requirement for which it was purchased and usually needs more early replacement than was originally anticipated.

The purchaser of our heating system has a right to expect our industry to protect him. We can do this only by setting up qualifications and standards by law, requiring everyone so engaged to conform to prescribed practices. Such legislation may be initiated by spontaneous legislative action, or by members of an industry. Our association has taken the latter course. While some persons may claim licensing is prompted by selfish motives, we must recognize that that which helps the industry also helps the public.

While our proposal does not require examination of present members of the industry, we believe that in the course of a few years higher standards will have their effect.

We want to express our thanks and gratefulness to all associations and persons throughout the state who have already extended their hand in cooperation and counsel. We invite every association of contractors and each individual contractor to join us in this movement. Following is our act:

An Act regulating the practice of Warm Air Heating Contractors and providing for the registration of same.

Section No. 1. (A) Be it enacted by the People of the State of Illinois represented in the General Assembly: After the first day of July 1935, it shall be unlawful for any person to engage or attempt to engage wholly or in part in the warm air heating or furnace contractor business, as defined herein, without a certificate of registration as a Registered Warm Air Heating Contractor issued by the Department of Registration and Education pursuant to the provisions of this Act.

(B) No association, partnership or corporation shall be granted a certificate of registration, and it shall be unlawful for an association, partnership or corporation to engage, or attempt to engage, wholly or in part in the warm air heating or furnace contractor business unless every member or officer of such association, partnership or corporation who actively participates in the business of such association, partnership or corporation shall hold a certificate of registration as a Registered Warm Air Heating Contractor issued by the Department of Registration and Education pursuant to the provisions of this Act.

(C) A certificate of registration shall be required for and with respect to the principal person of each location, branch or establishment from which such practice takes place.

(D) None of the provisions of paragraphs A, B or C shall require a certificate of registration in the case of any employee, agent or other person who is acting for and on behalf of a principal who is duly registered under this Act.

Section No. 2. (A) Any person contracting for performing any one, or any combination of the following practices shall constitute the practice of the warm air heating or furnace contractor business, namely; the installing, erecting, applying, repairing, altering, improving, servicing or maintaining warm air heating systems or furnaces, parts and/or equipment pertaining thereto.

(B) None of the provisions of paragraph A shall apply to fuel burning equipment or controls which are a part thereof.

Section No. 3. Any person who is twenty-one (21) years of age and of good moral character is qualified for an examination for a certificate of registration as a Registered Warm Air Heating Contractor, provided;

(a) He has graduated from a high school or secondary school approved by the Department of Registration and Education; or

(b) He has completed an equivalent course of study as determined by the Department of Registration and Education and has had at least three (3) years' experience in the office or shop of a Registered Warm Air Heating Contractor.

Section No. 4. Application for a certificate of registration may be made by applying for forms provided by the Department of Registration and Education. Each application shall contain proof of the particular qualifications required of the applicant under oath and shall be accompanied by the registration fee herein provided for.

Section No. 5. Any person applying for a certificate of registration under this Act shall be compelled to pass an examination to prove his qualifications as the board of examiners, herein provided for, may direct. Said examinations may be made in whole or in part in writing, and shall be fair and impartial, and of a practical and elementary character, but sufficiently strict to test the qualifications of the applicant.

Section No. 6. The Department of Registrations and Education shall conduct examinations of applicants for certificates of registration at such time and places as it may determine. The board of examiners shall be five persons, one of whom shall be a member of the faculty of the University of Illinois and the other four of whom shall be Registered Warm Air Heating Contractors residing in the State of Illinois and who have been engaged in the practice of a Warm Air Heating Contractor for a period of not less than ten (10) years.

Section No. 7. Whenever the provisions of this Act have been complied with, the Department of Registration and Education shall issue a certificate of registration as of a Registered Warm Air Heating Contractor. Any resident of the state, who prior to the first day of October 1935 applies in writing to the Depart-

Association Activities

ment of Registration and Education and proves, either;

(a) That for one year immediately preceding the first day of July 1935 he has continuously engaged at an established place of business in this state, or in any other state, in the practice of the warm air heating contractor or furnace business; or

(b) That he had, prior to the first day of July, 1935, graduated from an engineering course from an accredited university; he shall be granted a certificate of registration without examinations upon payment of the required fee.

Section No. 8. The fee for a certificate of registration as a Registered Warm Air Heating Contractor shall be Fifty Dollars (\$50.00). Said certificate shall be valid and have force throughout the State of Illinois. Each Registered Warm Air Heating Contractor who continues in active practice shall annually, during the month of July, renew his certificate of registration by payment of an annual renewal fee of One Dollar (\$1.00). Each certificate of registration, which is not so renewed, shall expire on the first day of August of that year. After a certificate has expired, it may be restored by payment of a restoration fee of Five Dollars (\$5.00), provided; the expiration has not existed for a period longer than five (5) years. Each certificate of registration shall be non-transferable to any other person. All certificate, renewal and restoration fees shall be paid to the Department of Registration and Education. All fees received by the Department of Registration and Education shall be paid into the state treasury.

Section No. 9. It shall be the duty of the Department of Registration and Education to see that the provisions of this Act are enforced. The Department of Registration and Education shall have the power by and with the advice and acquiescence of the State Attorney, in the particular County in which any violation of this Act may take place, to institute mandamus proceeding in the name of the People of the State of Illinois against any person who does not comply with the provisions of this Act, and to compel the observance of these provisions. The Department of Registration and Education with the assistance of the State Attorney shall institute and prosecute suits for the penalty provided for in this Act.

Section No. 10. Any person violating any provision of this Act shall be guilty of misdemeanor and shall be subject to a fine of not less than Fifty Dollars (\$50.00) nor more than Five Hundred Dollars (\$500.00) for each and every violation thereof and whenever such person has certificate as a Registered Warm Air Heating Contractor same shall be revoked by the Department of Registration and Education, provided;

(a) That the holder thereof has been given reasonable notice of the charge against him and has had an opportunity for full hearing before the Department of Registration and Education, and

(b) That the defendant in such action has twice previously been judged guilty.

For the purpose of conducting such hearings the Director of the Department of Registration and Education shall appoint three competent reputable Registered Warm Air Heating Contractors. The action or report in writing of a majority of the persons appointed shall be sufficient authority upon which the Director of the Department of Registration and Education may act.

Section No. 11. The Department of Registration and Education shall adopt rules, regulations and standards of practice in accordance with the provisions of the Civil Administrative Code and to carry out fully and enforce the provisions of this Act.

Section No. 12. The Department of Registration and Education shall keep a record open to the public inspection at all reasonable times relating to issuance, refusal, renewal, restoration or revocation of certificates of registration. This record shall contain the name, place of business and residence, and the date and number of registration of each Registered Warm Air Heating Contractor in the state.

Section No. 13. The certificate of registration required under this Act shall be placed conspicuously in the principal office or place of business.

J. E. Peterson, Secretary.

Fox Valley, Ill.

The annual meeting of the Fox Valley Furnace and Sheet Metal Contractors Association was held in the Masonic Hall at West Chicago on the evening of February 4th. A delicious dinner was served at 6:30 by the ladies of the Eastern Star, after which the business session was held.

Annual reports of the President, Secretary, Treasurer and various committees were presented.

A general discussion was held relative to association activities for 1935, plans being discussed for an extensive educational program for members and their employees.

There was considerable discussion on the proposed State License Law for Warm Air Furnace Contractors. This matter was referred to the Board of Directors with power to act. Walter Morton, a member from West Chicago, gave a very interesting blackboard talk on pattern drafting, showing a set of original and unique patterns designed by himself.

Fred Goetz, reporting as Chairman of the Nominating Committee, placed the following men in nomination to serve for the year 1935, all of whom were unanimously elected:

President—Jack Stowell, Aurora.
1st V.-Pres.—Fred Nolting, Elgin.
2nd V.-Pres.—A. J. Barkley, Batavia.
Secretary—Walter Eissler, Aurora.
Treasurer—William Wolf, Elgin.
Sergeant-at-Arms—Wm. A. Smith, Geneva.

Directors—Two years:
Wm. Klinkey, St. Charles.
Andrew Lind, Dundee.
Directors—One year:
Henry Heffelfinger, Oswego.
Fred Goetz, West Chicago.

The next regular meeting of the Association will be held at Elgin, March 11, notices to be sent out by the Secretary.

Walter Eissler,
Secretary.

Milwaukee, Wis.

At the mid-January meeting of the Sheet Metal Contractors Association of Milwaukee the following individuals were elected as officers for 1935.

R. S. Schmieder—President
Adolph Schumann—First V. P.
Rudolph Klubertanz—Second V. P.
Paul L. Biersach—Secretary.
Frank Ward—Treasurer
F. Kremer—Sergeant At Arms

The speaker of the evening was G. E. Ackermann of the Milwaukee Better Housing Program. The purpose of Mr. Ackermann's address was to point out just where the sheet metal contractor fits into the housing and repair program.

Several active committees reported progress.

Paul L. Biersach,
Secretary.

Cuyahoga County, O.

On December 13, 1934 the Cuyahoga Composition Roofers' Association, Inc., elected the following officers:

President—A. L. Sacheroff, Weatherite Co.

Vice-President—F. I. Huntington, Huntington-Immke Co.

Secretary—S. I. Rose, Byerlyte Corp.

Trustees

D. N. Meyers, Byerlyte Corp.

S. L. Traub, Haskins Roofing.

W. H. Weenink, John Weenink & Sons Co.

H. E. Cook, Standard Roofing Co.

H. N. Cain, Manager.

Labor Committee

H. O. Mulvihill, Warren Roofing Co.

C. F. Leary, Standard Roofing Co.

F. I. Huntington, Huntington-Immke Co.

In reference to code compliance and organization we have set up a bid depository with the central bid depository at the Builders' Exchange Building. We are collecting our fees on the bid depository, and are issuing statements for a second assessment next month.

We have had one compliance hearing, and expect to have five suits in the near future for the collection of assessments from those few arbitrary members who have not paid.

H. N. Cain,
Manager.

Canton, Ohio

The Furnace and Sheet Metal Contractors' Association of Canton, Ohio, re-elected the following officers for the year 1935:

Charles Wills—President.
George Viers—Vice-President.
Harry Fravel—Treasurer.
Ralph J. Peters—Secretary.

Our membership now includes most all the leading sheet metal contractors in this county, others being added gradually.

The association has an exhibit at the Better Housing Show now in progress in Canton, using three booths, from which we expect good results.

A smoker and buffet lunch brings out our members at the first monthly meeting.

Last summer a picnic for members and their families was a big success. Many prizes were awarded in the contests. We are now making final arrangements for a dance for members and their families to be held at Hotel Northern on St. Valentine's day.

Ralph J. Peters,
Secretary.

Association Activities

Schenectady, N. Y.

I am sending you a copy of a resolution that will explain itself.

We will have tonight (Jan. 17) the second day after the resolution was passed, a meeting of the builders of the city, to consider it and to take such action as the joint attendance may think advisable. Whatever is done will have to be done very quickly and very decidedly.

There are those in Congress who have conceded and complained that the smaller merchants have been and are the worst hit by the depression and the way it has been handled.

I do not want to anticipate anything about our action than what has been done. If you are interested, we shall be glad to give further information later.

Resolution

WHEREAS, It is announced that the policy of the United States Administration is favoring a Construction and Building Plan to put labor to work in place of the dole plan that has been tried.

WHEREAS, It is reported that the builders of New York City are favoring, that if such plan is adopted, the work be done by contract or other plan, but in any case, the work shall be done by and under the supervision of the regular Master Builders and Contractors of the country.

WHEREAS, In the past few years work provided to tradesmen under the Emergency Act has been arranged for and supervised by others than regular established Contractors and Building Employers working under the Codes of the Construction Industry and other Codes provided by the National Recovery Administration.

WHEREAS, In these years these employers have suffered severely because they have had little or no work to do in their several lines of established business. They have been under heavy expense maintaining their plants and establishments besides paying taxes of all sorts, among them Local, State and Code Administration.

RESOLVED, That the Schenectady County Association Sheet Metal and Roofing Contractors do announce and proclaim that the members are employers and dealers in materials used in their trade. That they are working under Code No. 244 of the Recovery Administration and as such they should do any and all work that this Code provides for.

RESOLVED, That we appoint a Committee of three to confer with

other Local Contractors and Builders working under the Codes of the Construction Industry. That jointly we make such requests and demands as together shall be agreed on; that all work covered by the several divisions shall be done by Employers as the Codes provide for.

Committee appointed: Vrooman, Stiefvater and Craig.

W. C. Vrooman,
Treasurer.

Buffalo, N. Y.

The Buffalo, N. Y. Sheet Metal Warm Air Heating and Air Conditioning Association held its regular monthly meeting at the Markeen Hotel on account of lunch and refreshments after the meeting. N. Adema was Chairman and Acting Toastmaster after the meeting and did a very fine job.

This meeting was attended by a large group of members of this association. We had the pleasure of receiving from the Owens-Illinois Glass Co. the Housing Act program, also circulars on Dust Top filters for each member of this association.

Mr. Lighthart of the Lakeside Co., heating engineer, has sent this association a package of letters containing a sheet to be filled out by our members to receive Furbie Institute engineering and sales bulletins.

Mr. Lighthart will give a warm air heating course on gravity and forced air heating to the members of this association in the near future. Plans and date will be announced later.

Code assessments of 1 per cent on gross receipts has been discussed. This Association protests against such a large amount, as it is too much of a burden on our line of work.

There has been a meeting called for all roofing, sheet metal and furnace contractors of Erie County here in the city of Buffalo. This was an open meeting to elect a committee to negotiate a collective bargaining agreement with the employees of the roofing and sheet metal industry.

W. Eisle and M. Reid of this association have been elected on this committee, W. Eisle acting as chairman of this committee.

Frank Minet donated the refreshments that were served at this meeting. Before dinner was served the latest ninth edition of the Standard Code was given out to members.

Leo J. Olear,
President.

Chicago

We are pleased to give you information about our Association. The new officers elected recently are:

President—R. H. Chorley.

Vice-President—E. J. Nemec.

Secretary—A. L. Nelson.

Treasurer—J. B. Serson.

Directors—Harry Pehl, J. J. Titterington.

Chairman—Emil Wodstrup.

Sergeant-at-Arms—Frank Hopp.

Delegates for the Central Committee—Paul Barth, Chairman; E. J. Nemec, R. H. Chorley.

In regard to the Code—we shall cooperate with the code administrators in all things that we deem fair. We shall oppose unfair obligations imposed upon us unless we are given due consideration. We do believe that cooperation with the code authorities will tend to unify the industry.

The Master Furnace and Sheet Metal Assn. has a furnace and air-conditioning committee that expects to bring important phases of this work among members this coming year.

A. L. Nelson,
Secretary.

Memphis, Tenn.

At the present time our association is inactive. We are doing our very best to get reorganized. Will inform you as to the outcome.

Our line of business has been very bad. Building is almost at a standstill. Nevertheless, we are looking forward to the new year and hope conditions will improve.

W. L. Eichberg,
Secretary.

St. Louis, Mo.

On January 7th the Associated Sheet Metal, Air Conditioning and Heating Contractors of St. Louis, Inc., had their installation of officers.

The business was held to thirty minutes, and a speaker discussed the City's campaign to get people to improve real estate now.

Luke Tiernan, Jr., President, was presented with a very fine leather brief case by the members, after which the program committee had prepared barbecue ribs and beer, to the accompaniment of a colored band and entertainers. The boys ate, drank and laughed until—?

The officers installed for 1935 are:

Luke Tiernan, Jr.,—President.

C. F. Harris—1st Vice-President.

J. Robertson—2nd Vice-President.

Wallace Cavallo—Secretary.

Benj. Kolbenschlager—Treasurer.

A. A. Cuneo—Sergeant-at-Arms.

Wallace Cavallo,
Secretary.

Letters



From Readers

We Still Don't Know American Artisan:

Although out of the warm air heating picture due to ill health and in bed recuperating, I picked up the October issue of your paper and found on page 18 an article written by Mr. Frank E. Hess on "What Burns Out Grates?" This article is quite amusing to me, particularly because if the builder, the stoker and the candlestick maker were to enter the argument there would be no end of good, bad and indifferent viewpoints.

But let us allow it to remain first with the editor, who probably has never, and possibly could not, install a plant properly if all the appurtenances were placed into the cellar for him; second, with Mr. Hess, who probably has given all his time to manufacturing furnaces, but little time to installation; third, to myself who gave all my time to installation for the past 50 years.

Personally, I always took quite an interest in the performance of the various furnaces and the installation. I was a pioneer in the double casing with an inch of space between the two casings to avoid heat loss; the 12 to 18-in. deep cone-shaped top filled with ashes to avoid heat loss through the top and to deflect the heat into the pipes; and last, but not least, the trunk line system adopted by me about 40 years ago. Since that time I have not installed an individual pipe system, but have converted many individual pipe systems to the trunk line system with marvelous results.

Answering Mr. Hess by paragraphs:

Paragraph 1. As we go on, answers will come out in other paragraphs.

Paragraph 2. Perfectly reasonable that the draw center grate burns out (as we term it) in one part and remains intact in another because it is extremely rare that the entire grate is embedded in ashes at one and the same time. If it were, the draft would be so completely cut off that a hot bed of fire could not be produced, so only that part of the grate which lies in ashes is the part that melts. With the triangular bar, however, only one bar is buried in ashes as a rule, hence

this bar starts to bend and if the fire gets too hot the bar starts to melt.

Paragraph 3. Here is where I disagree with most heating men, be they installers or manufacturers. Don't give too much air; don't buy coal that has iron or other minerals that make slag; don't force fires to make either slag or clinkers; but above all, don't poke your fires.

Paragraph 4. Yes, back to and before 1891 we talked then as we do now about burning out grates, when in fact we did not burn but melted them. The question arises, where does this slag of 1-in. diam. of which he speaks, come from; it can't come from the ashes because the ashes have already been shaken through the grates. It cannot come from the grates, as invariably the melted ore is still on the bars or the grates as the photos show. Also with a stream of slag coming from wherever it may, of one inch diameter, how much time would be necessary to fill an ash pit partly or completely and would this slag fuse with the bottom of the ashpit and would it be much trouble to remove it? I am asking these questions because on the whole it is news to me.

Paragraph 5. If your customer was down shortly before and shook down all the ashes, where did he get the ashes that he was supposed to be melting so fast. In fact, I question if he could melt or even make any with as hot a fire as you claim he had. My idea is that the fuel would fuse into clinker. I am also surprised that this man did not get scalded when throwing water on these hot surfaces.

Paragraph 6. Here your story reads plausibly and logically when using a poker, for where the poker can be brought into action ashes can be brought down while at the point where the poker cannot be used the fire is out and ashes cold. I think, however, that the correct answer to clinker is not fused ashes, but a fused hot fuel bed before it reaches the stage of ashes or perhaps so hot that it is past the stage of going into ashes.

One need only to make a comparison between the chimney of the average dwelling and the 100 to 300 ft. factory chimney. The domestic chim-

ney has draft enough with proper firing to keep a live fire for heating purposes without making or creating clinkers. The 300-foot factory chimney is built for the purpose of having an extremely strong draft and intense hot fire to create a high steam pressure. Most of the grates are rotary type with automatic feed, feeding the fuel in at the front end and by the time this fuel reaches the rear end where it is dropped into the ash pit it has passed the stage of making ashes or clinker but to cinders. So I question that if once ashes are formed that they can be fused to clinkers or slag.

Paragraph 7. Your professors and engineers are both right and wrong, as generally we know, as they cannot see anything when the ash pit is full. A full ash pit should be conclusive proof that the grates are bedded in the ashes and with a live, hot fire on the top, the melting process takes place.

I cannot agree with the professor who advocates the cleaning of the pipe and chimney if a grate melts, when the ash pit is clean. First, if the ash pit is free of ashes, grates will not melt, though they may break by rough treatment or poker use. Second, if the smoke pipe and chimney needs cleaning it is certain that a hot enough fire could not be built to melt a grate. Instead of keeping water in the ash pit keep a thin layer of ashes on the grate and the draft closed. Also, why shake a grate when your fire bed is already too hot? Instead, opening the check would be a better course to follow. Once clinker has been formed to shake the grate is of no avail and as it grows larger the fire bed grows weaker.

In my own 50 years' experience I have had many strange experiences with ashes but must confess that I never saw them fuse like iron into slag.

R. L. Spellerberg,

We Liked It, Too

I want to commend you on your article "Down to Bed Rock." Of course our commendation lies in the fact that we agree with you. The Indiana plan of organization for Code Administration takes the County for a unit and designates District and State Boards

Letters From Readers

as solely boards of appeal, specifying that all questions shall be settled locally. We believe it would be well for the nation to adopt the Indiana plan, expanded to take in Zone and National organization. We hope to present such a plan to the Conference shortly. Paul R. Jordan.

You can Vote, Too

What a surprise I received when I read Mr. Meder's remarks in the December issue under "Letters from Readers," relative to how he wants "old time" news about furnaces and sheet metal and less about air conditioning.

I am afraid Mr. Meder did not express himself correctly in his letter, because a man educated to the extent of being able to do air conditioning as he states, surely would not want to

waste his time on reading that an eight-inch pipe has 50 sq. in. face area or the outside air duct must be 80% of the area of all warm air pipes, or that baseboard register boxes must maintain the area of the pipe leading to the box.

As for not being able to understand the articles which are published month by month, I can see where a man would have a hard time understanding the articles if he just read every third issue. It's like missing school three weeks and returning to find the class way ahead and talking a foreign language.

The writer started on the road for the Lennox Furnace Co. in May, 1926 and Charlie Schechter, Sales Manager, told me, in starting out as a green salesman, "Art, read everything you can get your hands on relative to

heating." One of the first publishing companies mentioned was the American Artisan. I feel a very deep sense of gratitude to Charlie because I have not missed one issue since that time and the good I have received can not be measured.

The cold facts are, Mr. Meder, the steam and hot water men are staying awake nights trying to figure out a way to "cage" all the air conditioning and sub-let the duct work to tinnerns. I know you or I don't want them to take the profit on all the equipment.

So Mr. Meder, let's get down to work and all of us pull together on this air conditioning game and appreciate what the Artisan is trying to do for all of us dealers. We must remember, its through the Artisan that we dealers in Kansas City and California learn how you do things in Cleveland and New York and, how we like to hear about it for \$2.00 per year.

Begging to remain a warm friend, I am,
Arthur W. Hunt.
Kansas City, Mo.

The Indiana Convention *(Continued from page 15)*

our contractors becoming solely installers with the selling organization taking the profit from the material and equipment and acting as general contractor with the builder or owner.

Mr. Meyers announced the education program laid out by the Technical Educational Committee of the National Warm Air Heating and Air Conditioning Association. The purpose of this program will be to train and furnish speakers from the industry to address gatherings of contractors on technical and business plans and to talk before luncheon clubs, women's clubs and so forth.

The first look at the proposed Indiana legislation setting up a state NRA Act was given by J. M. Dyer, legislator. The purpose of the bill is to make NRA effective in Indiana by placing Indiana courts behind the act.

G. A. Voorhees, Chief Engineer, The Furblo Company, presented one of his popular black board discussions of the Mechanical Code. As usual, numerous questions were asked by contractors. A typical room was taken by the speaker and the calculations to arrive at the heating requirements were discussed step by step.

Roofing problems was the subject of a talk by Mostyn Snyder, Cer-

tain-Teed Products Corp. The main theme of the address was a plea for contractors to follow a pre-determined plan in getting business. Such a plan was suggested to consist of these steps—1: Locate your market and concentrate on that area; 2: Canvassing is essential and should be followed religiously; 3: Maintain close contact with property owners by direct mail, advertising, letters, personal calls; 4: In roofing work orders should be closed quickly; 5: Displays in windows, sign

Resolution

The Indiana Sheet Metal, Warm Air Heating and Roofing Contractors' Association of Indiana, Inc., in Convention assembled, hereby enter vigorous protest against that part of Code of the Furnace Manufacturers permitting them to sell direct to the Consumer at factory cost,—plus overhead expense only, in either gravity or mechanical installations.

We condemn such practice as being unethical and grossly unfair to our industry.

We further protest against the practice of certain manufacturers of warm air furnaces in the sale of their product to Mail Order Houses,—and to others at less than one-half of the prices which they charge to the regular trade and condemn such practices as being grossly unfair,—and out of harmony with the efforts of the National Industrial Recovery Act, to correct abuses in trade practices.

Respectfully submitted,—

O. Voorhees,
Harry W. Neal,
W. C. Teschner,
Committee.

boards, display floors are excellent and should be used freely; 6: A show room is desirable and can be made a definite part of any sales campaign; 7: Manufacturers finance plans should be taken advantage of.

F. R. Widmer, Republic Steel Corporation, gave an interesting discussion of stainless steel, pointing out that 18-8 is the commonest alloy in use with consumption of the material increasing rapidly. A reason for the cost of this sheet is due to the fact that many grinding processes are required in addition to the usual rolling operations.

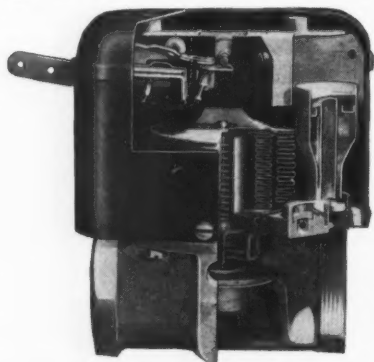
Six interesting features of stainless steel were pointed out. 1—The polish is obtained by much grinding. This polished surface must be protected carefully against scraping, hard metallic objects, anything which may scratch the surface. 2—Sheets should be kept away from all iron table tops, or iron equipment because in touching iron the iron deposits a film on the stainless surface. Later this iron film will rust destroying the polished appearance although actually not affecting the sheet. 3—The paper which comes on the polished surface should be left in place until all working operations are completed. 4—Stainless can be soldered, but a special flux and solder must be used and all residue must be carefully washed off with soap and water. 5—To solder use a heavier than ordinary copper and more heat.

New PRODUCTS

For your convenience a number has been assigned each item on this page. A coupon will be found on page 65. Check the items you are interested in and mail the coupon to us. Complete information will be forwarded.

101—Power Gas Valve

Penn Electric Switch Co., Des Moines, Iowa, announce the new Penn power gas valve, Type 900. The features claimed by the company are: a water-tight case which will stand immersion



in water; an ability to move as much as 20-pounds of load on the damper arm; the absence of all packing and the usual form of leather diaphragm. Gas is sealed in tight with double metallic walls. The valve is normally held in a closed position by means of a powerful spring. Interruption in the circuit supply or any mechanical failure of the actuating element provides positive closure and holds the valve in the off

or safe position. No lubrication is required and closely fitted bearings and gears are eliminated.

The gas valve operates on the vaporization of liquid principle. Full explanation of the operation by means of cross-sectional drawings of the apparatus are given in a leaflet which the company will be glad to mail.

102—New Welder

The Lincoln Electric Company, Cleveland, Ohio, announces a new alternating current welder of the motor generator type which takes 2 phase or 3 phase alternating current of standard voltages and frequencies and converts it into alternating current of lower voltage and at that higher frequency most suitable for arc welding with either heavily coated or washed electrodes in all positions.

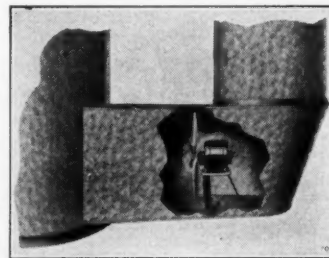
The manufacturer claims the following advantages:

- (a) Improved arc characteristics.
- (b) Improved weld metal.
- (c) Better power characteristics from the line.

The new welder is built in portable and stationary AC motor driven models in two sizes. The smaller capacity machine can be used for continuous welding with electrodes of $\frac{3}{8}$ inch to $\frac{1}{8}$ inch in size.

103—Fan for Cold Air Boot

A propeller type, four-bladed fan, and another unit with six blades with direct connected motor and suitable framing for attachment to the floor or housing of the cold air boot, is announced by Propellair, Inc., Springfield, Ohio. The first size with four blades is powered by a $\frac{1}{20}$ H.P. (80



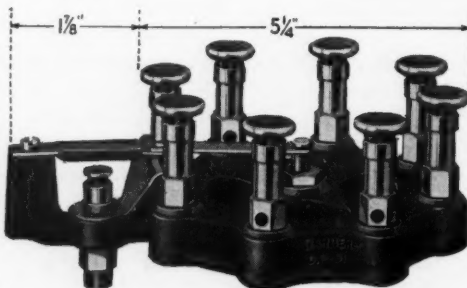
Watts input) motor and is said to move 1880 cubic feet of air per minute (free air delivery). The second type, with six blades, is powered by a $\frac{1}{50}$ H.P. (45 Watts input) motor and is said to move 800 cubic feet of air per minute (free air delivery).

Information on the new units has been compiled in a leaflet which may be obtained from the manufacturer.

104—New Burners

Barber Gas Burner Company, Cleveland, Ohio, announces a new line of special burners specifically designed for use in such appliances as Banana Room Heaters, Circulating Heaters, Clothes Dryers, Coffee Urns, Coffee Roasters, Cone Machines, Floor Furnaces, Pop Corn Machines, Garage Heaters, Hair Dryers, Laundry Stoves, Space Heaters, Steam Tables, Sterilizers, Warming Ovens, etc.

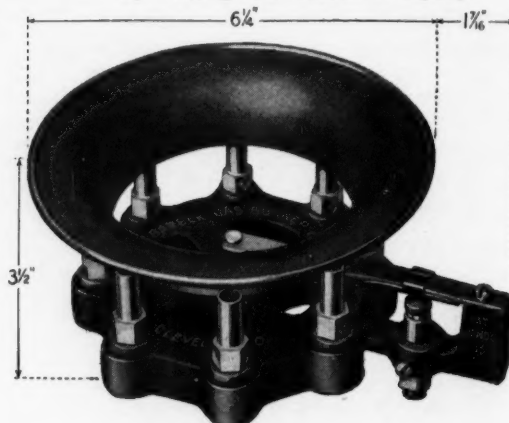
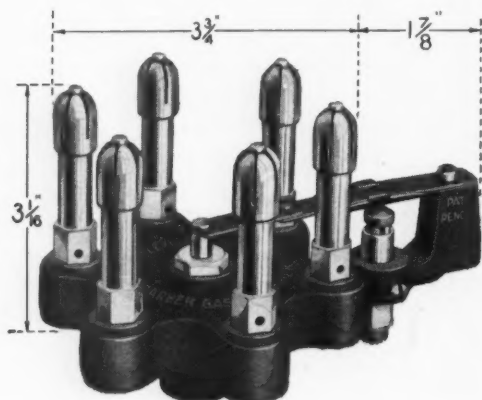
A feature of all these units is the fully automatic safety pilot control.



Because such appliances are usually installed in public places such as hotels, clubs, restaurants, institutions, schools, beauty parlors, etc., the automatic control is a vital point in protecting patrons and employees against accidents and fire hazards.

These gas burners incorporate all the recommendations of the American Gas Association Testing Laboratory as to safety, economy, and efficiency.

Manufacturers, jobbers and users of gas burners may secure information, by writing the Barber Company.



WHITNEY LEVER PUNCHES

No. 4B PUNCH



Length—8½ inches. Capacity ¼-inch hole through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—¾" to 1" by 64ths.

No. 6 PUNCH



Length—26½ inches. Capacity—¼-inch hole through ¾-inch iron; especially adapted for button punching or tamplet work. Punches and dies ¾" to 1" by 32nds.

No. 91 PUNCH



Capacity—¼-inch hole through ¾-inch, 1-inch hole through ¾-inch and 2-inch hole through ¾-inch iron. Depth throat 5-inches. Weight—82 lbs.

We have tools for every purpose needed by Sheet Metal Contractors.

Ask your Jobber

No. 1 PUNCH



Length—34 inches. Capacity—¼-inch hole through ¼-inch iron. Punches and dies in sizes from ¼ to 1 by 64ths.

No. 2 PUNCH



Length—23 inches. Capacity—¼-inch hole through ¾-inch iron. Punches and dies in sizes ¾-inch to 1-inch by 64ths.

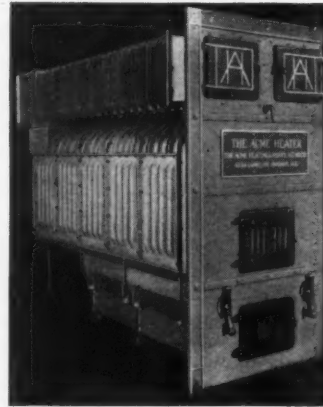
CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two Punches interchangeable, including punches and dies. Capacity—¼-inch hole through ¾-inch iron.

W.A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

STURDY CONSTRUCTION



"It's
In
The
Fins"

"It's
In
The
Fins"

An extremely important consideration in the proper design of a direct transmission heater is weight. Often, this point escapes attention because it has little bearing on efficiency. Adequate weight, however, insures durability and long life. Consequently, the Acme Heater is constructed entirely of cast iron, built up in heavy sections which are bolted together to form a monolithic structure, perfectly air and gas tight. This sectional construction, moreover, enables the heater to withstand the stresses set up by the expansion and contraction caused by extreme temperature changes. . . . The scientific chemical combinations in the cast iron used in Acme Heaters resist the deteriorating effect of the sulphuric gases of combustion.

For full physical data see advertisement in American Artisan, January, 1935, page 75.

THE ACME HEATING & VENTILATING CO.
4224 LOWE AVENUE CHICAGO, ILL.



Now! The Most Liberal Dealer Offer We've Ever Made -- on the U. S. STEEL FURNACE

We want to help you get started as one of our active, successful, prosperous dealers. If you are dependable and aggressive, we'll send you floor samples of the wonderful U. S. Steel Furnace, without your investing a cent now. You can start right away making sales and earning profits for yourself—and have until July to pay for your floor models.

Here is the greatest offer we have ever made—on the greatest furnace ever built. You'll find it easy to sell the "U. S." In both design and construction, it is far above all competition. It truly does a finer job of home heating. Mail coupon today and get the U. S. dealer proposition.

U. S. PRESSED STEEL PRODUCTS CO.
KALAMAZOO, MICHIGAN

The U. S. Steel Furnace, without casing. Note straight-sided streamlined body—massive double size radiator—extra large combustion chamber. Made of heavy fire box quality open hearth steel, double arc welded into practically one solid unit. Not a single cemented joint. Circulates air 35-50% faster, with corresponding fuel economy. Ideal for air conditioning jobs.

Mail
Coupon Today
For the Liberal
U. S. Dealer
Offer

U. S. PRESSED Steel Products Co., Kalamazoo, Michigan
Please send me full information about the U. S. Steel Furnace and your liberal dealer offer.

Firm Name

By

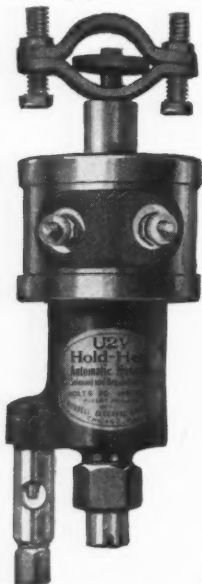
Street & No.

City & State

New Products

105—Humidity Valve

The Hold-Heet Humidity Valve is 5 devices in 1—No. 1, a pipe attachment clamp which requires the drilling of a $\frac{1}{4}$ " hole on the lower side of the water supply pipe with the projecting nipple above the sediment line in the bottom of the pipe. No. 2, a strainer.

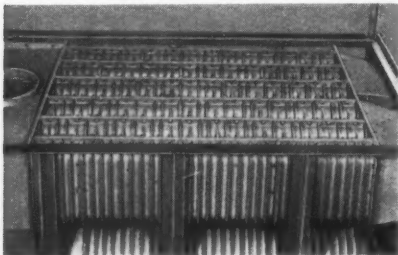


No. 3, an electric solenoid valve of low current consumption. No. 4, an adjustable flow regulator using asbestos packing under adjustable compression. The arrangement is such that the flow of water assists in closing the valve. No. 5, a visible drip fitting shows the rate at which water for humidification is being supplied.

106—Horizontal Furnace

A new direct transmission heater developed by the Acme Heating & Ventilating Co. of Chicago is known as the Acme Heater. It is constructed entirely of cast iron and presents as its feature, the construction of the radiator section.

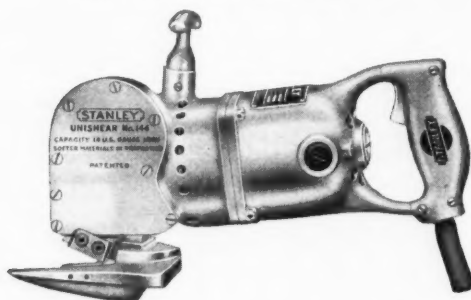
The radiator tubes, oval in cross section, are arranged in such a way that the gases of combustion pass through six tubes, each extending the



full length of the heater. These tubes are smooth on the inside, facilitating cleaning; the outside is covered with extended heating surface, or "Fins." They are so constructed and spaced as to allow an exceptionally large area of contact, an adequate free area, and the proper velocity of the air to be heated. The "Fins" on adjacent sections of the radiator tubes form oval shaped "flues" through which the air to be heated passes.

107—Unishear

A new portable Stanley-Unishear recently brought out by The Stanley Electric Tool Division, New Britain, Connecticut, cuts up to 14 gauge hot rolled steel, other materials in proportion, at a speed up to 15 feet per minute; yet it weighs only 19½ lbs. It cuts straight lines, curves, angles and notches. It cuts to a minimum radius of 2½ inch either right or left hand. Inside cuts can be made by punching a 3 inch hole and slipping the yoke through. With this tool

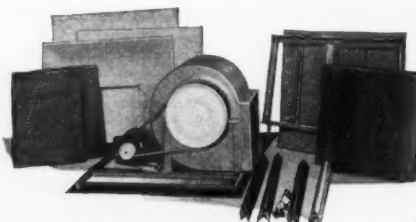


large sheets can be cut and trimmed, and turned up edges cut off close to the surface.

Some of the mechanical features are: Universal motor; steel worm on ball bearings; bronze worm gear and heavy alloy eccentric shaft on ball bearings; gear case, sealed against oil leakage and dirt; blades are easily removed for sharpening.

108—Blower

The Brundage Company, Kalamazoo, Mich., announces a new blower unit, designed for all types of domestic and other small installations where im-



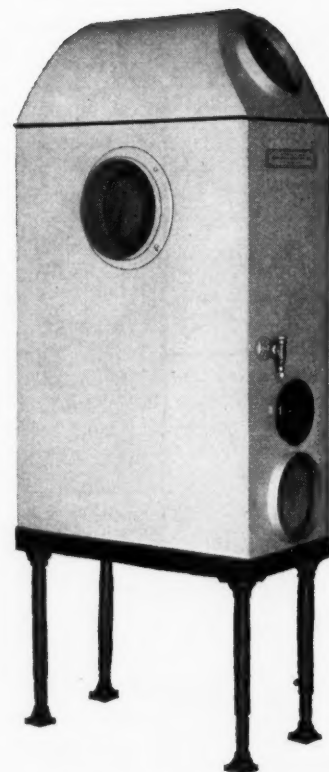
proved circulation of heated, filtered air is desired.

The new Blower is collapsible; it is shipped knockdown, and can be carried through any ordinary door without difficulty. The manufacturer claims it can be completely assembled, ready for attachment to ducts and furnace, in less than 20 minutes.

Regardless of blower position, the rear and both side panels may be quickly removed at any time, making filters, blower and motor readily accessible.

An improved motor suspension automatically takes care of any belt stretch. An adjustable motor pulley makes it possible to change centers without moving the motor on its base.

The Brundage cabinet is attractively finished in duotone green and the side panels are insulated against noise.



109—Humidifier

Announcement is made by the United States Air Conditioning Corp., Minneapolis, Minnesota, of the new heat saving humidifier for oil burner installations.

The humidifier consists of a housing on adjustable legs, with suitable connections for the smoke flue and one return from the structure and one supply main. Hot gases of combustion enter the inside, baffled housing and are then carried into the chimney. Air from the structure is introduced at the bottom of the outside housing and passes up around the heat chamber and is introduced through suitable ducts and registers into the structure. A spray nozzle in the top of the outside housing throws a fine mist directly down on the heated surfaces causing rapid evaporation.

The heated and humidified air is then introduced into the structure by gravity flow entering the structure at a temperature of about 180 degrees and at a volume of approximately 200 C. F. M. A drain is provided to carry off surplus water.

110—Aluminum Paint

A new flexible aluminum paint, which gives a scale-like metal sheathing for longer protection plus a smooth, brilliant finish, has recently been announced by the Roxalin Flexible Lacquer Co., 800 Magnolia Ave., Elizabeth, N. J.

Dirt and dust do not attach themselves readily to the surface. Because of excellent water-resistant qualities (including salt water) it stands washing and gives resistance to chemical fumes, humid atmospheres, corrosion, rust and decay.

One standard grade serves for both indoors and outdoors. One application covers stained and discolored surfaces completely with a metallic coat.

The Wisconsin Convention

(Continued from page 22)

The Educational Committee Program for selecting and training speakers to address men's and women's luncheon clubs and group gatherings of a similar nature was outlined by Mr. Van Alsbury. In addition, he declared that a program was under way wherein a moving picture showing the development and status of forced warm air heating and air conditioning would be prepared and contributed to by manufacturers and made available for any organization having the means of showing such a film.

Effective Comfort

Edwin A. Jones, engineer, L. J. Mueller Furnace Company, Milwaukee, presented an interesting discussion of the comfort chart. Mr. Jones explained how the body is like a heat engine. Food

is consumed and from the food a Btu output of heat is obtained just as we obtain heat by burning coal in the furnace. The body must always be 98.6 degrees F. Heat is lost by convection, radiation and evaporation, of which evaporation accounts for the largest loss.

From this the speaker showed how in the wintertime it is necessary to add humidity and heat to the air in order to be comfortable since the air entering from the outside is relatively dry and lacking in heat. Conversely, in the summertime the outside air generally has too much heat and frequently has too high a humidity. Thus it is necessary in summertime to decrease the temperature and also decrease the amount of moisture in the air.

The comfort zone and its change in position on the comfort chart for summer and winter was

explained by the speaker. One of the interesting points brought out by the speaker was the relatively small cooling effect to be obtained by air circulation.

T. H. Torr, engineer, Rudy Furnace Company, Dowagiac, Michigan, discussed the subject "Where Does Heat Go?" Mr. Torr explained on the blackboard how heat is lost through walls and windows. He also explained how infiltrating air within an enclosure tends to drop the inside temperature and this incoming air must be warmed to room temperature. Mr. Torr explained some of the basic formulas of heating, such as 1 Btu is the amount of heat required to raise 1 pound of water 1 degree or 55 cubic feet of air 1 degree or 1 cubic foot of air 55 degrees.

The importance of calculating heat losses due to cold ceilings, uninsulated attics, large glass areas, and cold floors, was emphasized.

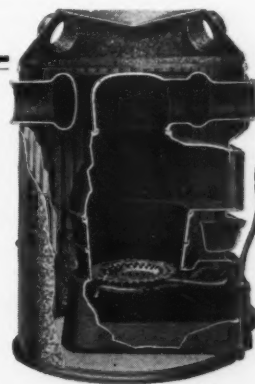
They Click with Home Owners

You work along the line of least resistance when you sell the Moncrief line.

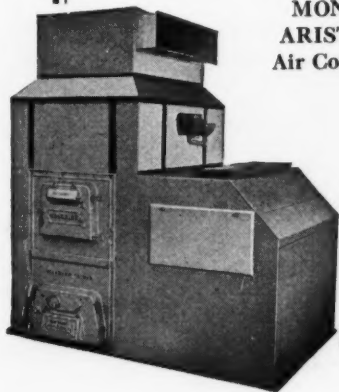
Show a home owner a Moncrief Furnace or Air Conditioning System. The fine appearance attracts him. Explain the modern features of construction. He is

easily convinced of Moncrief superiority. And lastly, the price is right.

The Moncrief line includes cast and steel furnaces, gas furnaces, conditioning systems for coal, gas or oil, humidifiers, blower and filter units, and a complete line of warm air pipe and fittings.



SERIES "C"
Sectional
View

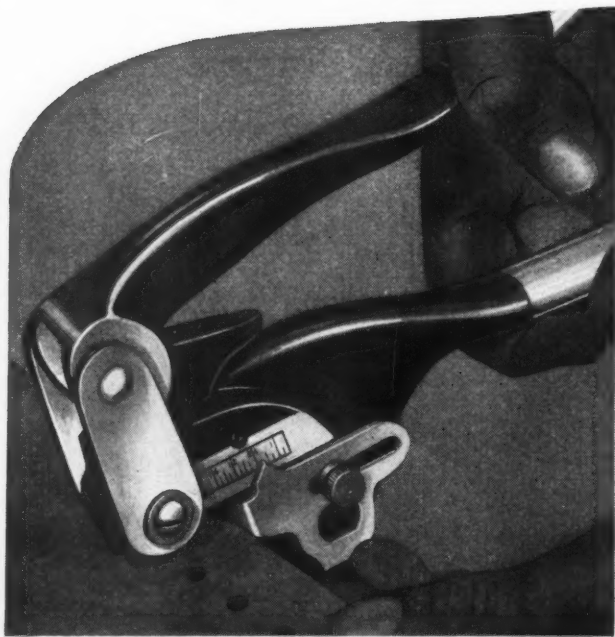


MONCRIEF
ARISTOCRAT
Air Conditioner

Our proposition is a money maker for live dealers. Ask us for details. You will be interested. Write today.

The Henry Furnace & Foundry Co.
3473 E. 49th St.
Cleveland, Ohio

MONCRIEF



HYRO No. O.X. METAL PUNCH OUTFIT

Most Powerful of its Size!

It's a Powerful Work-Saver, too

You can punch holes as large as $1\frac{1}{64}$ inch in metal up to 14 gauge with the Improved Hyro No. O.X. Metal Punch. And you can do it with ease! Yet this Tool is very convenient to carry and handle. It measures only 8 inches overall and weighs but 2 $\frac{3}{8}$ pounds.

Think how often you could use this fine Punch . . . how much time and labor it would save you. In a short time it would return the small investment of \$5.90 (F.O.B. N.Y.) which buys not only the long famous Hyro Metal Punch . . . but a set of 7 Punches and 7 Dies, fitted in a sturdy steel case.

In the last year over 8000 sheet metal workers have taken advantage of this big value. You can get yours from a nearby supply house, or by mailing the coupon below.



\$5.90 (F.O.B. N.Y.)

Buys this Complete Outfit

PRODUCT OF PARKER-KALON CORPORATION

Parker-Kalon Corp., 190 Varick St., New York, N. Y.

Have nearest jobber ship me a HYRO No. O.X. Punch Outfit at the \$5.90 (FOB, N. Y.) price.

Name.....

Address.....

Parker-Kalon Products Are Sold Only By Recognized Distributors

News Items

Air Conditioning Short Course

The Michigan State College Course at East Lansing, Michigan, will be given Wednesday, Thursday and Friday, March 27 to 29 inclusive, under the auspices of the National Warm Air Heating and Air Conditioning Association. This will be the fourth year this course has been given.

Inasmuch as the College is a state institution, this course is put on for the benefit of the trade without cost, but in so doing it is open to residents of any state at no charge other than a \$1 registration fee. Actually this fee covers only the banquet, which is given the second night of the school meeting.

The course will be elementary in nature so it can be easily understood by all interested whether they are high school graduates or not.

Further announcement will be given regarding complete details of the program in a later issue. Those wishing immediate information may write to Prof. Lorin G. Miller, Division of Engineering, Michigan State College, East Lansing, Michigan.

Living expenses for the three days are a small item; rooms can be obtained for \$1 a night and meals at reasonable rates.

Death of Park B. Doing

Park B. Doing of Miller & Doing, Inc., Brooklyn, N. Y., died November 1st at his home at 236 Stratford Road, Brooklyn, N. Y., in his 72nd year. He is survived by his wife, Beatrice A. Doing, and the following children: Mary D. Robertson, Warren P. Doing, Mahlon D. Doing, Robert B. Doing, Park A. Doing.

At the time of his death Mr. Doing was president of Miller & Doing, Inc., but for the past seven years had been practically retired from active participation in the affairs of the corporation which was being managed by his son, Warren P. Doing, and associate, H. J. Breininger.

Mr. Doing was well known to the sheet metal trade throughout the entire eastern territory. Mr. Doing was born in Crown Point, Ind., on April 8th, 1863. When he was eleven the entire family migrated to Maryland and it was there that he went to school and started his family life.

He was employed by the National Mould and Stamp Company in Washington, D. C., where he first met Robert Miller and in January, 1893, he and Mr. Miller in partnership engaged in the manufacture of sheet metal ornaments for the building trade. Their first factory was set up in Knox's Alley, rear of 216 C Street, N. W., Washington, D. C., and they struggled along for nearly a year until the panic of that year became so acute in their location that they decided to move to Brooklyn, N. Y., where the business has been conducted ever since. In 1907 the business was incorporated. Mr. Miller was elected president and served in that capacity until he passed away about two years ago.

Where to Write for F.H.A. Data

The Trade Publication Division of the Federal Housing Administration has been established to issue factual information on the F.H.A. It will also send any or all of the following publications to anyone interested:

- FHA-8 Information leaflet
- FHA-101 Property owners' booklet
- FHA-102 Community campaign booklet
- FHA-103 Builders' booklet
- FHA-104 Manufacturers' booklet
- FHA-106 Community planning booklet
- FHA-107 National Housing Act
- FHA-108 Equipment permitted or excluded

Requests should be mailed to the Trade Publication Division, Federal Housing Administration, Washington, D. C.

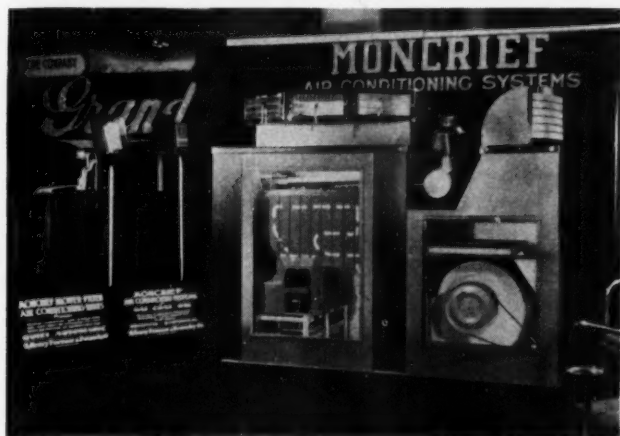
American Radiator Company Makes 5,000th Loan

The Heating & Plumbing Finance Corporation, a subsidiary of American Radiator Company, announces that the 5,000th loan under the Federal Housing Program has been made. The first loan was made August 13th. The 5,000th loan was made December 20th.

News Items

Heating Equipment at Cleveland Exposition

Nearly one-quarter million Clevelanders and Northern Ohioans visited the Cleveland Public Auditorium, during the period December 29 to January 6, to view the displays of manufacturers at the Cleveland Exposition. This show was one of the biggest of its kind ever staged. Several



manufacturers of heating and air conditioning equipment displayed products in attractive booths around the exposition floor. The photographs show some of the exhibitors and their booths. Forest City Foundries Company showed products used for heating, cleaning, humidifying, circulating and cooling the air in houses—introducing the idea of year-around air conditioning. Henry Furnace & Foundry



Company displayed the Moncrief air conditioning system employing a gas furnace and blower-filter section. The J. M. & L. A. Osborn Company had a display consisting of a gravity furnace, several lines of registers and grilles and a gas air conditioning unit. Iron Fireman Manufacturing Company had an exhibit of three units, ranging from small domestic to large industrial types, with the well-known Iron Fireman and an operating chart showing control of the system.



ALL the Parts in ONE box!

Saves Time on Damper Control Jobs

Hyro Damper Controls, favored by sheet metal workers everywhere, now come in handy "complete set" packages. Everything needed for a damper control job is included to save you the time and bother of getting together all of the different parts. You'll appreciate this convenience, and you pay nothing extra for it.

Your supply house will furnish the Hyro Sets in the sizes you wish. You can obtain either the UNXLD Damper Quadrant, long known as the standard and best control device; or the Hyro Dial Damper Regulator which is inexpensive but thoroughly efficient. Included with both are the necessary Damper Bearings, correct size Parker-Kalon Sheet Metal Screws for fastening the control to the duct, and the rivets for attaching Bearings to damper.

Send the coupon for Hyro Damper Control circular.

*Inexpensive Hyro Dial
Damper Regulator Set*



PRODUCT OF PARKER-KALON CORPORATION

Parker-Kalon Corp., 190 Varick St., New York, N. Y.
Send me your circular on HYRO Damper Control Sets and
HYRO Accessories.

Name.....
Address.....

Parker-Kalon Products Are Sold Only By Recognized Distributors

RACKETEERS OF WASTE



Whether You Pay Them Tribute Depends on What Sheet Metal You Buy!

When you use GOHI Pure Iron-Copper Alloy for sheet metal construction you are protecting your buildings against these racketeers over the greatest number of years, because GOHI is the longest-lived, wear-, weather- and corrosion-resisting, low cost ferrous metal you can buy. It is the pure iron, alloyed with the right amount of copper that gives GOHI its acknowledged superior qualities—the one metal you can safely trust under the most destructive conditions.



GOHI Pure Iron-Copper Alloy is available in all sizes and gauges. Produced exclusively by The Newport Rolling Mill Company, Newport, Kentucky.

GOHI

SHEET METAL

Pronounced "GO-HIGH"

News Items

A. O. Jones, President, U. S. Register Company, Dies

Almon Oak Jones, founder and president-treasurer of the United States Register Company, inventor of the Jones side wall, warm air register and active citizen of Battle Creek, Michigan, died December 18.

Mr. Jones had been in robust health during most of his life and it was only in November that he became so ill that he had to cancel a Florida trip. Mr. Jones was removed to a sanitarium on November 4 when he suffered a sudden attack and was given an emergency operation. Mr. Jones appeared to be recovering when complications developed which caused his death.

In addition to being very active in Battle Creek business and social affairs, Mr. Jones has been active in the warm air heating business since 1901. In 1902 Mr. Jones organized the United States Register Company, the growth of the business subsequently requiring establishment of branch factories in Minneapolis, Kansas City, Des Moines, Albany, New York, Denver and San Francisco.

Prior to the formation of the United States Register Company, Mr. Jones was connected for some eleven years with R. J. Schwab & Sons of Milwaukee and the Boynton Furnace Company of Chicago.



Contractor Wants Literature and Prices

P. L. Parker, after February 15 to be located at 123 N. Court St., Rockford, Ill., would like to have manufacturers' literature and price lists. Mr. Parker is doing general warm air heating, sheet metal and air conditioning work; in addition, he contemplates handling oil burners controls and humidifiers.

National Warm Air Meeting

The spring meeting of the National Warm Air Heating and Air Conditioning Association will be held at the Deshler-Wallick Hotel, Columbus, Ohio, June 4, 5, 6, 1935.

Should Coal Dealers Clean Furnaces?

A rather spirited discussion took place at the annual meeting of the Committee of Ten on the question of whether coal retailers should clean furnaces. After a long discussion it was the sentiment of the meeting that coal dealers very properly can clean furnaces where heating equipment concerns and furnace dealers are not doing so; that certainly there should be at all times and in all communities cooperation between the fuel supplier and the heating equipment man in this type of work. The furnace and heating dealers pretty generally agree that the main reason they provide cleaning service is because this leads to a great deal of furnace repair business and that while furnace cleaning generally has not been found to be profitable, the results from repair orders make for a fair profit and at the same time insures the home owner a more efficient heating system.

New Literature

For your convenience in obtaining copies of New Literature, use the coupon on page 65.

201—Whitney Metal Tool Co. Catalog

A pocket-size catalog of products manufactured by Whitney Metal Tool Co., 91 Forbes St., Rockford, Ill., covering the complete line of items manufactured, is announced. The catalog covers angle iron machinery, bases, benches, benders, brakes, bars, hammers, notchers, power press equipment, punches, shears, tables and stands.

Each item is covered in complete detail with tables showing dimensions and weights and list prices. Discounts from list prices are given in the first part of the catalog. A new addition to the catalog is a table to be used to select the number of the punch to be used in punching a certain size hole in a certain thickness of material. Table covers plates from one-eighth to one and one-quarter gauge and punch diameters from one and one-quarter to one quarter inch.

202—Peerless Bulletin No. 204

Bulletin No. 204 is announced by Peerless Electric Company, Warren, Ohio, covering the Peerless line of exhaust fans. The feature of the catalog is the announcement that an eight-speed (use three-speed) controller which permits easy selection of any three of the eight speeds under control of the indicator type rotary switch can be applied to the fans manufactured by the company. The catalog shows propeller type ventilating fans, housed kitchen exhausters, six-blade ventilating fans and multi-blade exhaust fans. Each fan is accompanied by a table of sizes, ratings and characteristics. Prices are also included.

The company's Bulletin No. 203, covering Peerless air conditioning equipment and controls, is also available to contractors. This catalog shows the blower-filter units, washer units and bonnet controls. Capacity data including R.P.M., H.P., free air delivery and air delivery against various static resistances are covered.

203—Stainless Steel Leaflet

American Rolling Mill Company, Middletown, Ohio, has published a new piece of literature entitled "5 Advantages You Want and Will Get from Armco Stainless Steel." The leaflet describes the six finishes which the company makes accompanied by some information on the forming and selling, corrosion resistance and heat resistance of this material. The two stainless steels now manufactured by Armco are: Armco 18-8 and Armco 17. Armco 18-8 consists of chromium, nickel and carbon while Armco 17 consists of chromium and carbon without any nickel.

204—Winter Air Conditioning Portfolio

A loose-leaf portfolio of price sheets, data sheets, design and construction sheets with tables of characteristics and also including leaflets for the consumer, has been compiled by Air Controls, Inc., 1933 West 114th Street, Cleveland, Ohio.

The various bulletins contained in the portfolio describe the Air Package forced air circulating and filtering units, the AC blowers and the Miles automatic furnace fans and louvers. Tables of sizes, capacities and prices are included for all items.

The sales literature covers the advantages of forced air circulation, shows typical installations and gives full information on the various products recommended.

205—Control Leaflet

The Automatic Products Company of Milwaukee, Wisconsin, has just published a new condensed catalog showing all of the standard automatic controls which they manufacture.

This catalog gives complete information on A-P instruments, is fully illustrated, and gives complete specifications as to catalog numbers and list prices.

A copy of this valuable reference catalog can be had by addressing the above company at 121 North Broadway, Milwaukee, Wisconsin.



Boomer Boiler Plate Furnaces

Also made with duplex grates and upright shaker.

Have been successfully made for 23 years. Where introduced have given satisfactory service. The fire pot liners are the best we can buy and we know of several Boomers that still have the original liners in, which are 22 years old. We have been making cast iron Boomers for 50 years.

If you are interested in selling a strictly high grade furnace, ask for prices and agency.

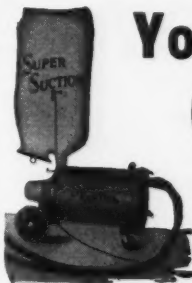
Nothing but the best of material enters into the making of Boomers.

When repairs are needed, avoid risk of dissatisfaction by ordering direct from the original patterns. Prices are low.

We sell to legitimate dealers only.

THE HESS-SNYDER CO., MFRS.

Massillon, Ohio



You, Too, Can Make More Money

SUPER Suction furnace cleaners are picking up profits for their owners every day. Hundreds of these happy furnace men found out about the Super through our famous free trial offer. Let us ship you a Super. Use it 3 days. Clean furnaces with it, chimneys (from the basement—not the roof), air ducts, registers, pipes with the specialized tools that go with the Super at no increase in price. See for yourself how it earns a profit on cleaning and also digs up prospects, boosts your new equipment, repair and general service business. This free trial costs you nothing. You are not obligated. Return the Super if you want to—few do. This is our way of proving to you that the Super is the cleaner you want—the cleaner that will make money for you—the most modern and fully equipped cleaner in the market.

USE THIS COUPON—CHECK YOUR CHOICE

THE NATIONAL SUPER SERVICE CO.,
1944 No. 13th St., Toledo, Ohio.

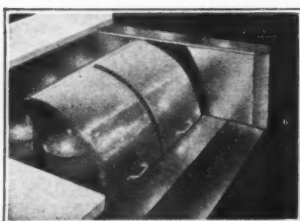
- ☐ Send me a Super Suction Cleaner on free trial for 3 days after arrival.
- ☐ Tell me all about the Super and the free trial offer.

Your Name

Street Number

City and State.....

Special Precautions No Longer Needed When You Use



APOLLO CHROM COPPER

in order to realize a savings of from 30% to 50% over alloy sheets.

APOLLO Protex

is now used to cover the highly finished surface of these tarnish and rust reducing sheets. It speeds up work, prevents scratches in the brake, or during assembly, and insures first class workmanship. Is stripped off afterwards without muss or bother.

Endorsed by sheet metal men who have used it on APOLLO ChromCopper for restaurant equipment, marquees, ice cream cabinets, table tops, etc. Is applied on Satin Finished or Highly Polished APOLLO ChromCopper.

Write for your generous working sample today and be prepared to offer APOLLO ChromCopper for fine work—and for greater profits in 1935.

APOLLO CO.

BOX A
LA SALLE, ILLINOIS



LIBERTY

LIBERTY makes two complete lines of furnaces. The **MELLOW** line is cast iron. The **FRONT RANK** line is steel. Dealers representing these lines are at an obvious advantage. Write today for complete details.

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LIBERTY FOUNDRY CO. SAINT LOUIS

New Literature

For your convenience in obtaining copies of New Literature, use the coupon on page 65.

206—Air Conditioning Booklet

Russell Electric Company, 342 West Huron Street, Chicago, Illinois, announces a new air conditioning booklet entitled "Hold Heet 4-Unit Air Conditioning." An interesting chart is presented to show the four major air conditioning functions, described as follows: 1. heating (winter); 2. humidification (winter); 3. air circulation and filtering; 4. cooling and dehumidifying.

The booklet shows the four Hold-Heet units which comprise the four steps of air conditioning. Unit No. 1 consists of automatic control of temperature and combustion and features the thermostat, transformer, stack limit control and damper motor for gravity installation.

Unit No. 2 covers automatic humidity for furnace heated homes. The apparatus consists of humidistat, humidity valve and humidifier.

Unit No. 2-3 covers winter air conditioning for boiler heated homes with radiators. The apparatus consists of a fan and filter section with the necessary controls and a water evaporating chamber which is connected to a hot water supply from the boiler.

Unit No. 2-3 for winter air conditioning where a central system with ducts can be used is also described and shown by drawings. The apparatus consists of a fan, filter, heat exchanger and evaporator for humidification.

Unit No. 3 is a winter air conditioner for forced air circulation and consists of filters and fans housed in a cabinet ready for connection to the furnace.

Unit No. 4 consists of a housed blower to be installed in the attic for summer ventilation. Drawings and photographs show the unit and its proper application.

207—Blower Catalog

Schwitzer-Cummins Co., Indianapolis, Indiana, has prepared a new catalog showing the company's line of "Hy-Duty" blower units for forced warm air furnaces, attic ventilators, air conditioners, humidifiers, dryers, etc. The general construction and design of the blower units together with detailed descriptions and illustrations of such parts as bearings, wheels, etc., are covered. A blueprint section in the catalog gives performance characteristics and specifications for all the models of blowers manufactured.

208—Insulation Catalog

A new insulation idea known as "Ferro-Therm" is announced in a catalog published by American Flange & Manufacturing Company, Inc., 26 Broadway, New York City. This material used is commercial black steel formed in such a way that the sheets of steel comprise parallel spaced metallic sheets and air spaces. The small ribs keep the sheets apart and the insulation depends upon low emission and high reflection values to radiant heat.

FURNACE REPAIR PARTS..

National parts are made to repair a furnace that has been used. They "fit the job" better because they are made for a condition that *is* and not that *was*.

Nothing is obsolete with National!

Send For Price List A-22

NATIONAL FOUNDRY & FURNACE CO.
DAYTON OHIO

New Literature . . .

For your convenience in obtaining copies of New Literature, use the coupon on page 65.

210—Transformer Catalog

The General Electric Company announces leaflet GEA-1358A, covering General Electric control and signal transformers. The leaflet describes many possible uses for these transformers; also gives full details of construction; covers Underwriters' Standards and special applications. Full tables of ratings and data for operation on the various lighting circuits with volt-ampere characteristics and allowable load on intermittent operation are given for each transformer.

212—U. S. Register Co. Discount Sheet

United States Register Company, Battle Creek, Michigan, announce a new discount sheet, dated January 1, 1935, and applying to the company's catalogs Nos. 21 and 24. The sheet covers dealer base discounts on shipments of less than 50 pieces in one-lot shipment to one destination.

The discount sheet covers baseboard registers, sidewall registers, baseboard cold-air faces and intakes, air conditioning and forced air registers and vents, air controlling registers showing base discounts and referring to the proper pages in catalogs Nos. 21 and 24. Specialties manufactured by the company are covered similarly.

213—Furblo Window Poster

The Furblo Company, Hermansville, Michigan, will furnish free of charge to interested contractors a large poster sheet, to be placed in windows or located in the display room, covering Furblo Series 50 and 60 Complete "Package" Units. The theme of the poster is "Now Is the Time to Install This New Air Conditioner." The package unit is shown in color, in large size, with stars covering the special features. A table of guaranteed performance ratings is included and text explains that the unit can be installed without shutting down the furnace for as little as \$100 to \$150, depending upon the length of time and necessary alterations required.

214—Directional Flow Register Catalog

A new catalog entitled "Adjustable Surface Control of Direction, Volume, Velocity" is announced by the Waterloo Register Company, Waterloo, Iowa.

This new catalog gives full information on the new directional flow registers which permit the air to be directed fan-shaped from the wall or down towards the floor. Photographs and sketches show the appearance of the new registers and the various angles at which the louvers can be set to control the angle of air delivery. The new line includes also registers so designed that part of the air can be directed fan-wise and part of the air toward the floor; also combinations of fan-wise, upward and downward. Included in the booklet is a section devoted to return air intakes from the same line of items. Also modern grilles and operating devices for adjustable louvers. A section of the catalog covers specifications and dimensions.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave., Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Check numbers in which you are interested):

101	102	103	104
105	106	107	108
109	110		
201	202	203	204
205	206	207	208
209	210	211	212
213	214		

Name..... Title.....

Company.....

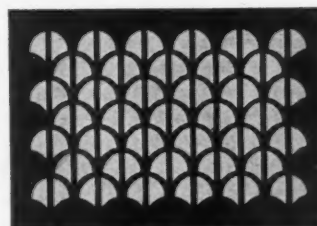
Address.....

PERFORATED METALS

ARCHITECTURAL GRILLES

In Bronze, Steel, Stainless Steel, Monel, Aluminum, and other metals. Grilles of distinction for fine buildings in a wide variety of attractive designs. All of the standard and many original and modern designs are available in any metal, and of all dimensions, carefully made from selected stock. Grilles are but one of our specialties. We make Perforated Sheets of every type.

Pleasing
Prices,
Prompt
Service



50 Years
Experience
Perforating
Metals

The
Harrington & King
PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

WRITE FOR COMPLETE INFORMATION

If you haven't seen what you want in registers, cold air faces and grilles, ask us. We make Independent "Fabricated" in any size, any finish. Remember, 82% open area.

**INDEPENDENT
REGISTER AND
MFG. CO.**

3741 E. 93d. St.
Cleveland, Ohio

EXPERT SOLDERING



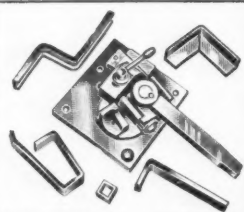
is made easier with Gardiner Flux-Filled Solder — it enables experienced mechanics to do faster work and inexperienced help to do neater work. Its high tensile strength assures permanent bonds. Due to the most modern methods of production this quality brand of solder costs no more than ordinary solders.

We also make a complete line of bar and solid wire solders and babbitts.

Gardiner
METAL CO.

4831 So. Campbell Avenue
Chicago, Illinois

Available in 1, 5 and
20 lb. spools.



UNIVERSAL BENDER.
Simple to operate. Nothing to get out of order. Capacity, $\frac{1}{2}$ " x 2". Bends cold. Smallest square 3" x 3" cube.

RIVET SETS. Whitney rivet sets are drop-forged from the highest grade steel and designed to fill every requirement. Sold in 10 different sizes.



WHITNEY METAL TOOLS

Use Whitney tools in your shop. We manufacture a full line. Only a few of the many items can be shown in this advertisement.



IMPERIAL ROLLER BEARING PUNCHES. Offered in 3 sizes. Will work inside 90 degrees. Quick changing for punches and dies. No cams to wear. Stripping positive.



RIVET PUNCHES & DIES. We can supply a complete assortment of rivet punches and dies from stock.

Good tools are essential to a profitable business. Make it a habit to use Whitney tools and to consult us on any tool problem.

WHITNEY METAL TOOL CO.

91 FORBES STREET
ROCKFORD, ILLINOIS

VIKING

THE TOOL THAT EVERY SHOP SHOULD HAVE



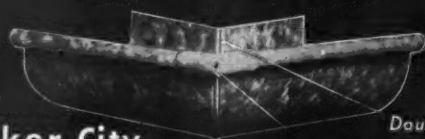
When a shop is equipped with Viking Shears, it has the best cutting tools that can be obtained—accurate, rugged and dependable.

Send today for complete information.

VIKING SHEARS

VIKING SHEAR CO., ERIE, PA.

"BB" QUALITY



Quaker City Mitre

Double Seam
Reinforced Corner

WRITE FOR "BB" CATALOGUE
Order from your jobber

Mitres, conductor pipe, hangers, eaves trough, caps, outlets, pipe hooks and fasteners

BERGER BROTHERS CO.
229-237 ARCH STREET, PHILADELPHIA, PA.

With The Manufacturers . . .

Meyer Furnace Co., Conference

Meyer Furnace Co., Peoria, Ill., held its annual sales conference January 28, 29, 30. Those attending, as shown in the group picture are:

Back Row: Left to right—E. F. Drebus, G. A. Kelly, V. S. Losch, J. B. Sauer, A. R. Lyon, W. E. McFarland, C. B. Warren, C. J. Heintzman, Otto Falkenhainer, H. L. Jackson.



Second Row: Left to right—G. A. Dancy, H. C. Hoffman, Vernon Parks, O. F. Rempke, R. J. Reed, E. F. Giles, C. E. Helmle, R. S. Quimby, R. M. Wallis, J. B. Wallis, H. V. Walker.

Seated: Left to right—L. M. Baugh, W. J. Boesch, Chas. Spindler, F. E. Mehrings, Geo. F. Meyer, W. E. Look, F. L. Meyer, W. J. Bruninga, R. E. Asher.

The company reports the most enthusiastic sessions in several years and an even greater improvement in 1935 over 1934 than in 1934 over 1933.

C. L. Hewitt Advanced

L. J. Mueller Furnace Co., Milwaukee announces that C. L. Hewitt, Jr. has just been made eastern sales manager, with headquarters in Baltimore.

Mr. Hewitt has been connected with the Mueller Company for 14 years, several years as road man, but for the past seven years Baltimore Branch Manager.

In his new capacity as eastern sales manager he has charge of all eastern territory from Maine to Florida.

Robertson Appointed Milcor Manager

Announcement is made by Louis Kuehn, president of the Milcor Steel Company, Milwaukee, Wisconsin, and Canton, Ohio, of the appointment of M. G. Robertson as manager of the New York branch.

Mr. Robertson has been with the Milcor Steel Company since January, 1934. He has been actively engaged in sales work on fireproof building products for more than 13 years, having been in the employ of a number of the largest steel companies during that time.

CAPITOL HAS IT

REPAIRS
FIREPOTS—GRATES—BARS to Fit Any Heating Plant

CAPITOL FURNACE & STOVE REPAIR CO.

227 S. MERIDIAN

INDIANAPOLIS, IND.

With The Manufacturers . . .

Merger Unites Two Control Firms

The recent consolidation, whereby the Brown Instrument Company of Philadelphia, became a subsidiary of Minneapolis-Honeywell Regulator Company of Minneapolis, unites two of the largest and oldest firms in the temperature control field.

Both companies are pioneers, the Brown Instrument Company having been established in 1860, while the Minneapolis-Honeywell Regulator Company was organized in 1885. Today, Minneapolis-Honeywell maintains branch and distributing offices in fifty-eight cities and subsidiary companies in Canada and Europe. The Brown Instrument Company maintains twenty-two branches throughout the United States.

The consolidation comes on the eve of the 50th anniversary of Minneapolis-Honeywell and completely rounds out and complements its line of heating, ventilating, cooling, humidifying and air conditioning control equipment for domestic and large building applications as well as its line of automatic industrial process controls.

The Brown Instrument Company's business has been exclusively in the industrial field and consists of a complete line of instruments for indicating, recording and controlling of temperatures, pressures, flows, liquid levels, CO₂, speeds, etc., serving such varied industries as oil, power, steel, chemical, glass and automotive industries. The Brown Instrument Company will be operated as a separate company and it is expected that all of its branches and personnel will be maintained. Both companies will maintain their own identity in the sales field.

New Ilg Representatives

Ilg Electric Ventilating Co., Chicago, announces representatives for Ilg products in territories centering in Des Moines, Iowa; Omaha, Nebraska and Tulsa, Oklahoma. The addresses of these offices are—N. J. Bigham, Y. M. C. A. Building, Des Moines, Iowa; George C. Mittauer, 4966 Hamilton Avenue, Omaha, Nebraska, and P. E. Eber-sole, 214 S. Victor, Tulsa, Oklahoma.

Sutherland Joins Enterprise Company

Enterprise Boiler & Tank Works, 1955 North Long Avenue, Chicago, Illinois, announce the addition of Floyd Sutherland to the company's sales and engineering force. Mr. Sutherland has been connected with the heating industry since 1925 when he joined the Fox Furnace Company of Elyria, Ohio, as retail sales engineer in the Indianapolis, Indiana, branch. In 1927 Mr. Sutherland acted as measuring engineer for the National Warm Air Heating Association carrying on the determining of basic measurements for member manufacturers. Mr. Sutherland was connected with Bergstrom Manufacturing Company of Neenah, Wisconsin, in 1928 as sales promotion man and engineer.

Sell the BRUNETT PATENTED HEAT UTILIZER

The latest improvement in fuel saving—

Will Increase Your

... SALES
... PROFIT

and Will Save Your Customers 25 to 50%
of Their Fuel Costs

WRITE TODAY FOR DETAILED INFORMATION

BROWN SHEET IRON & STEEL COMPANY

Pioneer Welders of the Northwest

964 BERRY AVE. Nestor 7137 SAINT PAUL, MINNESOTA

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IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

Write for Journal and Stock List

JOSEPH T. RYERSON & SON INC.

CHICAGO MILWAUKEE JERSEY CITY BUFFALO PHILADELPHIA
DETROIT ST. LOUIS CINCINNATI CLEVELAND BOSTON

SHEETS

Install



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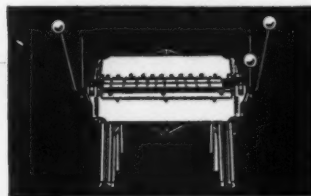
Improved
VENTILATORS

FOR industrial buildings,
schools, homes, theaters, etc.
Made in 14 different metals.
Constant ventilation—no noise
—no upkeep.

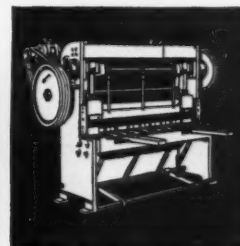
ÆOLUS DICKINSON
Industrial Division of Paul Dickinson,
Inc.

3332-52 South Artesian Avenue
Chicago, Ill.

CHICAGO



Box and Pan Brake



Power Squaring Shear

STEEL BRAKES—PRESSES—SHEARS

DREIS & KRUMP MFG. CO.

7404 LOOMIS BLVD.

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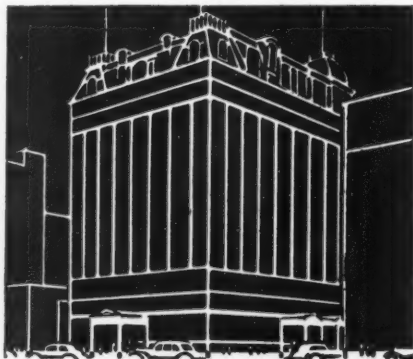
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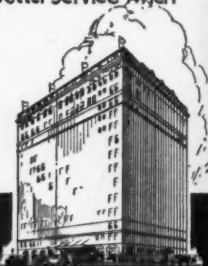
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With The Manufacturers . . .**Strangward Appointed Sales Representative**

Ralph G. Strangward has been appointed sales representative by The Forest City Foundries Company of Cleveland on Niagara Warm Air Furnaces, both coal-fired and



gas-fired, and Niagara Air Conditioning Units. He will travel Eastern Ohio and West Virginia.

After attending Ohio Wesleyan University, Mr. Strangward acquired a practical knowledge of modern residence heating through a varied shop experience.

New Revere Office

Revere Copper and Brass Incorporated, Dallas Division, announces the opening of an office at Room 1511 Telephone Building, 1010 Pine Street, St. Louis, Missouri.

Edward A. Harbeck will be the manager of the St. Louis office.

Harold Schaffner Joins Carr Heating Supply

Howard Mason, general manager of Carr Heating Supply Company, 414 North Dearborn Street, Chicago, Illinois, announces the appointment of Harold Schaffner to the sales staff. Mr. Schaffner will act as salesman in the local Chicago area calling on dealers.

Rudy Has Second Best December in 20 Years

Helped by the impetus of increased interest in home modernizing and building under the NHA and by introduction of a new line of house-heating furnaces, Rudy Furnace Co. announced its December orders from dealers are running 210% ahead of December, 1933. The month appears likely to close with the second largest order volume in 20 years.

Dollar sales for 12 months ending Nov. 30 were 34% ahead of corresponding 1933 period. Unit shipments of residential winter air conditioners were 93% and of furnaces 33% ahead of 1933.

Fred Goodall Joins Williamson Heater Company

Fred Goodall, long identified with the warm air heating trade throughout the central territory, has joined the sales staff of the Williamson Heater Company as manager of the Chicago office. Mr. Goodall's particular job at the present time will be to contact jobbers and establish jobber outlets for the Williamson line.

Mr. Goodall's address is 1278 Clybourn Avenue, Chicago.

New Ilg Office

Ilg Electric Ventilating Company, Chicago, Illinois, announce the opening of a new sales office at 122 Jay Street, Schenectady, New York. R. R. Cooper will be in charge.

CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. One inch \$3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date. Display rates for this page will be furnished on request.

SITUATIONS WANTED

SITUATION WANTED BY FIRST CLASS tinner and sheet metal worker. 30 years' experience. 50c per hour. Address C. A. Storck, Westmont, Illinois.

SITUATION WANTED—BY SHEET metal and furnace man. Married. Experience: Sheet metal and furnace—20 years; plumbing and hardware—15 years. Will consider any territory. Iowa or Minnesota preferred. Rex Falb, Forest City, Iowa.

SITUATIONS OPEN

WE WANT A PRODUCTION MAN in our truck tank department. We manufacture all kinds of oil delivery tanks and truck bodies. Must be a sheet iron mechanic, who knows welding and economic production, and well qualified in handling help. Please give experience, age, and salary expected. Boyle Manufacturing Company, Inc., 5100 Santa Fe Avenue, Los Angeles, California.

OPPORTUNITY—WE NEED FIRST class salesmen to represent us on the sale of Soot Destroyer, Boiler Water Treatment and Anti-corrosion Liquid for air conditioning units. Attractive propositions to the right man. Saginaw Salt Products Co., Saginaw, Michigan.

EXPERIENCED TRAVELING SALES- man wanted. Must be experienced in forced air and gravity heating. Address Key 306, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

WANTED: FIRST CLASS PLUMBER and steamfitter to estimate jobs in central part of Illinois. Give references and wages wanted. Address Key 305, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

SALESMAN WANTED: MANUFACTUR- er with complete line of furnaces, boilers and water heating equipment has open territory in Wisconsin, Illinois, Virginia, North Carolina and Indiana. Liberal commission basis. Our own men know of this advertisement. Address Key 304, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

Manufacturers Agents

MANUFACTURERS WANTING AD- ditional representation often come to us for names of prospective agents now handling other lines in this field on a commission basis in a definite territory. It will pay you to be on record with us so we can refer your name to interested manufacturers. No charge or obligation, of course. It is a service we render free to manufacturers and representative. Just drop a line that you are interested in being on file and we will send you form to fill out. Address American Artisan, 6 N. Michigan Ave., Chicago, Ill.

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FOR SALE—One Chicago Brake, 8 ft. to 30 gauge iron. W. H. Campbell, Alpena, Michigan.

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Rebuilt - Trade - In Machinery

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FOR SALE—P. S. & W. MACHINES. Small Burring; Large Burring; 30" Pipe folder; 20" Bar folder, good condition. Will trade large Burring for small Burring. Address: Jack Hansen, Hawarden, Iowa.

FOR SALE—PLUMBING, SHEET METAL and furnace shop in good town of 2,100 population. Best farming and dairy section in North Central Iowa. Cheap rent. Fine chance for man with small amount of capital. Falb & Son, Forest City, Iowa.

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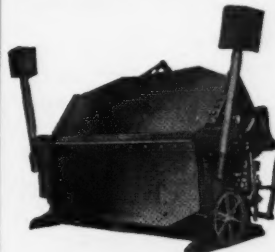
WANTED: COBBLE FACES AND REG- isters at a price. State quantities, sizes, make and finish, and lowest price. Address Key 307, "American Artisan," 6 North Michigan Avenue, Chicago, Ill.

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"Draw on the MOST COMPLETE STOCK IN AMERICA"

SOME REBUILT BARGAINS

Shears, Power, 12' 14 ga. Nla. M.D. & 10' 10 ga. Ohl.
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Roll, Power, 8' ¾" Bertsch Initial Type, 42" 11 ga.
Ironworker, Pels, 4x1½", No. 2 Buffalo.
8 Ft. and 5 Ft. Niagara Power Shear, ¾" cap.
15" sap.
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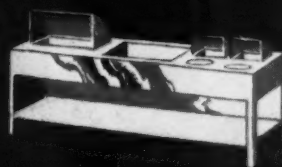
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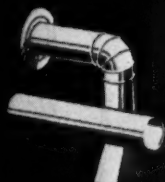
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BARS



KITCHEN EQUIPMENT



STOVE PIPE



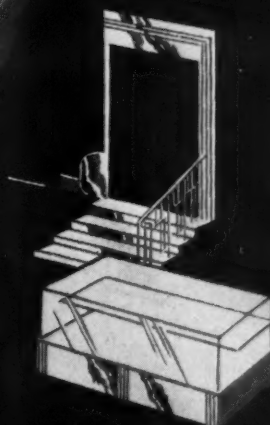
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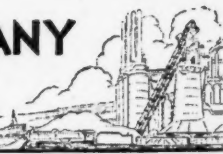
Electrical Sheets, Tin and Terne Plates — also U S S High Tensile Steel Sheets, and USS Stainless and Heat Resisting Steel Sheets and Light Plates. Literature describing these products will be sent upon request to nearest Sales Office.



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